United Nations Team for
Tsunami Recovery Support

Food and Agriculture Organization
of the United Nations

Assessing Opportunities for Livelihood Enhancement and Diversification in Coastal Fishing Communities of Southern India

By
Venkatesh Salagrama and **Thaddeus Koriya**

Integrated
Coastal Management

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Context of the study

The United Nations Team for Tsunami Recovery Support (UNTRS), based in Chennai, India, is facilitating the process of tsunami recovery in the region through specific interventions in strategic areas. The Food and Agriculture Organisation of United Nations (FAO) as a part of the UNTRS team aims to set clear directions to ensure sustainable livelihoods for fishers. It has a pro-poor focus.

With the fisheries sector suffering from both over-capitalization and resource depletion, the livelihoods of poor fishers and fisherfolk communities have been badly hit, and the tsunami has aggravated their misery. While relief measures have helped, what's essential for the long term is to improve livelihood opportunities. They need to be enhanced and diversified.

Many development interventions have been attempted. But what's needed is a viable people-centric approach that taps the strengths of coastal fisheries and draws on them. Hence this study on "Assessing opportunities for livelihood enhancement and diversification in coastal fishing communities of southern India."carried out by Integrated Coastal Management,Kakinada . The study covers tsunami-affected areas in Tamil Nadu and Kerala.

The study has analysed a number of inherent strategies of the fishers to enhance and diversify livelihoods, both past and present. It has come out with a planning framework for livelihoods enhancement and diversification.

Stakeholders in fisheries can make use of the framework, validate its usefulness, and decide and further develop appropriate tool box. They may then spell out the support and co-operation necessary from other stakeholders.

We thank and congratulate the study team for its expertise and hard work. We are grateful to Mr. Pieter Bult, UN Coordinator of UNTRS, the entire UNTRS team, Dr Daniel Gustafson, FAO India Representative, the FAO fisheries experts based in Rome and Bangkok, the UNDP, UNFIP and DFID for their support and co-operation. We thank all Government officers, NGO and INGO representatives, experts and fisherfolk representatives who have contributed directly or indirectly to the study. We are specially thankful to Ms. Leena Nair, IAS, Secretary, Animal Husbandary, Dairying & Fisheries and Mr. S. Vijayakumar, IAS, Director of Fisheries, Tamil Nadu for all support provided during the study.

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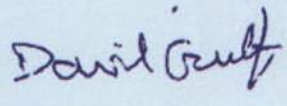
Foreword

The enhancement and diversification of fisheries livelihoods in coastal communities is a critical global concern of governments and supporting organizations such as the Food and Agriculture Organization of the United Nations (FAO). This challenge became even more critical following the devastation caused by the tsunami. It has been at the heart of the efforts carried out by the United Nations Team for Recovery Support (UNTRS) to ensure sustainable fisheries livelihoods in tsunami affected areas in India.

In this context, FAO and the UNTRS commissioned the present study by Venakatesh Salagrama and Thaddeus Koriya, of Integrated Coastal Management. The authors start with an analysis on how fishers have coped historically with livelihood challenges, in their own way, at the three different stages of fisheries development in India. Building on this analysis, the study then brings in a number of concrete examples from Tamil Nadu and Kerala as well as from Andhra Pradesh and Orissa. The authors then present a critical look into the factors that contribute to the sustainability of post-tsunami livelihoods interventions. The framework suggested by the study can be applied as a useful planning tool for fisheries enhancement and diversification programmes among coastal fisher folk. The authors argue for a bottom up approach and demonstrate the scope within the fisheries sector itself for sustainable livelihoods, provided that enhancement strategies are properly implemented.

I am confident that the study will be used by different practitioners to validate the framework and to develop appropriate strategies for fisheries livelihood enhancement and diversification. FAO as part of the Post-Tsunami UN Recovery Support Team is very pleased to have supported this study and we look forward to seeing the insights and recommendations taken up in new programmes in India and elsewhere.



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Contents

Executive Summary

The issue of livelihood enhancement and diversification amongst coastal fishing communities gained prominence since early 1990s. This is when doubts began to crop up about the capacity of the fisheries sector to contribute sustainably to the livelihoods, especially of the poor. There is a widespread perception that many of the recent initiatives have not been able to address the issue meaningfully: either in their impact upon the target groups or in contributing to a better understanding about addressing the issues of livelihood enhancement and diversification.

This study is based on the premise that fishing communities themselves harbour a wealth of knowledge, experience and understanding on livelihood enhancement and diversification. Understanding the strategies adopted by different stakeholders could be the starting point for more appropriate responses to the issue.

The study has attempted to develop a detailed, case study based, typology of different livelihood enhancement and diversification strategies adopted by the fishers at different stages of the development of the sector, and to assess the factors behind fisher's choices. For this purpose, it identifies three phases in the development of the sector: (i) **pre-Modernisation** phase, which is characterised by pre-industrial production and economic systems; (ii) **Modernisation** phase, which brought about a radical transformation in the sector since 1950s and (iii) **post-Modernisation** phase, which is not as clearly defined as the other two, but refers to a complex process of change that required various livelihood enhancement and diversification responses from the fishers.

In the pre-modernisation phase, the sector could provide no more than subsistence incomes. Hence the balance between opportunities and vulnerability in the sector was delicate. The strategies for livelihood enhancement and diversification sought to safeguard the existing scheme of things than to seek options for improving conditions. An important strand that runs through the systems of organisation (social, economic, political) in this phase was the emphasis on stability (economic and social) over profit maximisation. Community-based governance systems were important structures in the sector.

In the Modernisation phase, the opportunities provided by the sector for livelihood support increased manifold. Many new livelihood categories began to emerge in the sector. Market demand allowed entry of investments and more efficient technologies into the sector; natural resources too responded favourably to increased levels of exploitation. The government played an important role in this by providing fishing inputs and setting up necessary infrastructure, and also by encouraging the idea of the sea as open access. The conservative social-oriented organisation of fishing was not conducive for the new capital-intensive, profit-maximising, individually-run commercial operations.The social assets may have become weaker during this period. The additional income generated from the sector added to the risk-bearing capacity of the people. This is reflected in the strategies for enhancement and diversification during this period-emphasis was on maximising returns rather than on coping with seasonality and other vulnerability factors.

The post-Modernisation phase is marked by a period of crisis, where the opportunities provided by the sector have come down while the vulnerability has gone up, especially in the form of long-term trends due largely to the uncertainties in access to the raw material – i.e. fish. This was exacerbated by reduced access to investments, which was a result of global trade fluctuations, mounting costs of operations and weakening government support. This resulted in reducing the economic viability of the sector in the last decade.

The livelihood enhancement strategies in this period included:

1. Diversification of supplies, supply sources, markets and market strategies;
2. Optimising strategies, which included switching to earlier/cheaper technologies, changes to operations to reduce costs (onboard and on shore), changing sharing patterns, sharing risks through group operations, and consolidation of activities to make them 'leaner and meaner';

3. Loss reduction by bringing down losses in supply chains, thus raising returns with existing catches.
4. Protecting turfs at sea and on shore, including some self-implemented management measures, to protect access to resources and to markets
5. Taking advantage of technological innovations like GPS, mobile phones and other communication systems as a measure to optimise operations and reduce costs
6. Living for the day strategies, which involved dependence upon subsidies and credit to meet the daily needs of operation, just to survive for the day
7. Taking advantage of boom-and-bust opportunities which periodically opened new opportunities and helped to prop up the fishing economy before going bust again
8. Slash-and-burn fishing strategies, dealing with intensive and potentially destructive fishing methods to maximise the returns in the short term
9. Part-time strategies, which involved rationing the operations to 'safe periods' and
10. Political strategies, which aimed to improve the stake of the fishers and their access to the resources at the policy level.

The key livelihood diversification strategies in the post-Modernisation period included:

1. Seeking options within fisheries in the local context;
2. Seeking options outside fishing in the local context, which is reflected in the vast diversity of non-traditional activities that the women started to take part in over the years;
3. Seeking non- local options in fisheries, i.e., geographical migrations: which included the migration of fishers from the east coast to the west coast, from southern parts of the coast to the northern parts (in Kerala), and even extended beyond the borders of the country (Kerala migrants in the Gulf countries).
4. Seeking non local options outside fishing, which included people shifting to non-traditional options in new areas, for e.g., from the east coast to the west coast; from the Coromandel Coast to Southeast Asia.

The factors contributing to the livelihood choices of the fishers are basically responses to cope with their vulnerability context. This include a diverse range of considerations related to their expectations in terms of: livelihood outcomes (steady income, wages rather than shares), livelihood strategies (household based livelihood options), different assets, policy and institutional factors. Using a checklist based upon these criteria, underpinned by their sustainability-equity indicators, an assessment of the different livelihood enhancement and diversification strategies was undertaken. The assessment show that while these strategies do help the fishers in coping with the changes in the sector (especially with those related to markets and to a certain extent to overcapitalisation and investment issues), some of their choices are not viable from a sustainability perspective.Others will need to be supplemented by development initiatives to support, strengthen, or regulate them for more sustainable and equitable outcomes.

A similar exercise to assess the sustainability implications of selected tsunami-related initiatives (which involved assessing sustainability of ecological/natural resource related, technological, economic, social and institutional components for each activity) indicates that there are gaps in terms of their viability in the long term. The complementarity between the strengths and the weaknesses of the fishers and the external development agencies would suggest that, just as there is a need for improving the livelihood choices made by the fishers with better institutional support, it is equally important for the external support mechanisms to draw upon the strengths of the fishers in order to become more effective and sustainable.

The project developed a draft Livelihood Enhancement and Diversification Assessment Framework, on the basis of factors behind the livelihood choices of fishers and their sustainability. The framework was developed through a four-stage process to assess opportunities for livelihood interventions in fisheries.

In the final analysis, it is suggested that for most people, fisheries remains the most feasible option as a source of livelihood. This is not only because of lack of opportunities elsewhere, but also because the sector itself is quite robust to cope with the demands of the people depending on it. There is indeed a crisis over the capacity of fisheries to ensure sustainable livelihoods. But this has less to do with the inherent weaknesses of the sector, more to do with the way access to fisheries resources has come to be organised. This calls for measures to undertake some systemic changes within the sector rather than moving people out. There are few options outside fisheries anyway. This means that supporting the fishers by strengthening their livelihood enhancement strategies will be the most feasible way forward.

Still, livelihood diversification will continue to remain an important strategy for a number of people, and may become an urgent necessity for more number of people in the coming years. This is because some of the features of the present crisis in the sector have yet to run their full course and have the potential to marginalise many poorer people. It is suggested that the responses to this need will require a more nuanced understanding of the process of livelihood diversification, rather than as a simple process of shifting people from one block to another. It must start by developing the basic skills, knowledge and capacity of the fishers rather than by presenting specific ideas for diversification followed up with efforts to make people to relate to them which frequently boil down to fitting square pegs in round holes.

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Chapter 1: Introduction

Background

The subject of livelihood enhancement and diversification among coastal fishing communities has been debated since the early 1990s, when doubts started cropping up about the capacity of marine fisheries to contribute sustainably to livelihoods, especially of the poor. These doubts sprang from the fact that most fisheries had begun to show signs of distress.

A number of factors could have contributed to this distress: over-fishing and destructive fishing; urban, agricultural, and industrial pollution; destruction of critical coastal habitats and nurseries; reduced flows of freshwater. Whatever the causes, both fish catches and productivity have fallen, incomes have declined, the sector's contribution to the national economy has declined or remained static.

Fishing operations have suffered mounting losses, the misery of fishers aggravated by rampant indebtedness, high maintenance costs and reduction or withdrawal of various subsidies, direct and indirect. Some responses to the changing conditions – such as policy measures to conserve or manage coastal biodiversity – may also have added to the problems. Apart from the availability of fish, distribution issues too have been a matter of serious concern, with ***access*** to fish becoming increasingly difficult for poorer stakeholders in the supply chains.

Conditions have not been helped by the government's response to the livelihood needs of fishers – a response which still tends to be technology-driven and production focused.

The responses of the wider development community have not been wiser – something borne out by recent experiences in Tamil Nadu and Kerala. The point needs some elaboration. After the December 2004 tsunami, financial support for livelihoods in coastal fishing communities has been phenomenal. But little understanding has been shown of livelihood concepts. Agencies have stuck to the conventional notions of equating increased production with wealth creation, despite the glaring differences in ***access*** to assets for different stakeholders in supply chains.

Efforts to bring in a modicum of equity – by promoting group ownership of boats or providing boats to women's groups – have failed to take into consideration either the larger resource context or the local social context.

A major handicap in making viable interventions has been lack of understanding about well-established patterns of livelihood enhancement and diversification in fishing communities. How do fishers make livelihood choices? What factors and processes encourage or constrain such choices? These questions have not been discussed. Result: the knowledge and expertise of fishers in this area have been overlooked. The concept of diversification has been presented as a brand new idea 'invented' by the development industry.

Most Alternative Income Generation (AIG) programmes have been driven by the interests and inclinations of donors or implementers; fishers have been relegated to being 'recipients'. Their participation has been confined to choosing an item or two from a pre-determined menu of options. Invariably, the outcomes of such externally driven initiatives have pleased neither fishers nor the implementing agencies.

It is widely believed that many of the recent initiatives have not addressed the subject of livelihood enhancement and diversification meaningfully. They have not made much of an impact on target groups. They have not even led to better understanding of the issues.

Livelihood Enhancement and Diversification in Coastal Fishing Communities

Evidence shows that coastal fishing communities in several parts of India have a long history of livelihood diversification. This has often taken the form of migrations. In the traditional fisheries economy, which is largely subsistence-oriented, adaptations to deal with deprivation were a matter of survival.

A migration can be geographical (new location, same livelihood activity) or occupational (different livelihood activities, locally or elsewhere). Most geographical migrations mean movements of people over short or long distances, journeys across regions, states or countries, occasionally accompanied by

women who help with shore-based activities such as sorting, processing, and selling fish, besides of course housekeeping.

Occupational migration is more pronounced at the household level — different household members carry out different activities that contribute to family income. Women usually play an important role in occupational diversification, but older people and children are also active. Then there are combinations of migrations — seasonal/long-term; geographical/occupational; local/non-local. There are also examples of seasonal and long-term migrations happening simultaneously; of geographical and occupational shifts happening together – complicating the whole issue considerably.

Obviously, the need for such adaptations varies from place to place, depending on local conditions such as market demand, credit supply and the strength of social networks. Caste and culture play a role too. While some of the major fishing groups in South India, like the ***Mukkuvars*** of the south-west coast and the ***Pattinavars*** of the Coromandel coast, chose to develop adaptations largely within their existing livelihood systems and in the local context, the *Vadabalija*s of Andhra Pradesh developed a highly peripatetic mode of existence to cope with seasonal or long-term uncertainties in the sector.

Fishers have adapted to cope with vulnerability. That apart, the characteristics of the fisheries sector (fugitive resources, species diversity, uncertain returns, physical risk, and harsh working conditions) require fishers to be agile innovators. That they can take quickly to new ideas and tools, 'indigenise' them and change their own activities and work styles to take advantage of new opportunities is illustrated by the alacrity with which they accepted the process of modernisation and shifted to a shrimp-based export-market economy. The post-modernisation period provides another example: fishers made several adaptations to cope with difficulties they have encountered in fisheries since the 1990s.

There are thus two components to the process of diversification. The first relates to initiatives that seek to improve the quality of ***existing*** livelihoods (by optimising their performance at different stages in the supply chains (production, post-harvest and trade). The second relates to initiatives that seek alternative/ supplementary sources of income either within or outside fisheries, seasonally or round the year. In the literature on diversification, a distinction is made between the two components (Greenhalgh et al, 2006) as:

- Measures that seek to capture a higher proportion of the fisheries value chain (i.e. to move the producer up the value chain), termed as **vertical diversification**, and also as 'improved competitiveness'
- Investment in alternatives including those outside fisheries: a process that has been termed **horizontal diversification**

The two approaches are not mutually exclusive: fishers can, and increasingly do, pursue a diversified strategy. They can combine a more competitive role in fishing with other activities. In fact, this simultaneous adoption of vertical and horizontal diversification is crucial to understanding the livelihood context of many fishing communities in southern India. Increasingly, as the study will show, the conventional concept of 'one main earner- one major income source' – which was an outcome of modernisation in fisheries – is giving way to the pre-modernisation concept of the household being the basic unit of income generation (multiple earners, multiple income sources). This requires a fresh appraisal of the whole concept of livelihood support in the post-modernisation era.

Since the phrase 'livelihood diversification' has come to acquire a certain connotation in development (i.e., taking people out of one activity into another), this study uses the term **livelihood enhancement** instead of 'vertical diversification', and the term **livelihood diversification**[1] for what is understood as 'horizontal diversification'.

[1] *Just as diversification is an inclusive process incorporating enhancement strategies as well, 'enhancement' can be equally broad and encompass diversification strategies. Such distinctions are made to aid understanding rather than to erect artificial barriers that don't exist. This caveat will apply to most or all such classifications made in this study.*

Livelihood enhancement has also been used in a much broader sense than an effort to capture a higher proportion of the value chain. It includes acceptance and adaptation of new opportunities as well as measures to cope with adversity within existing activities. Together, livelihood enhancement and diversification are referred to by the acronym **LED**.

Focus of the study

This study is based on the premise that a wealth of knowledge, experience, expertise and understanding about livelihood enhancement and diversification exist among fishing communities. An understanding of the strategies adopted by different categories of stakeholders in fishing communities – along with their strengths and weaknesses – could be the starting point for developing more appropriate responses to the issue.

Does a better understanding of the livelihood choices made by fishers automatically provide answers to what is one of the most difficult and vexing challenges facing fisheries today? As the study will show, the choices of fishers are sometimes no more than 'back-to-the-wall' manoeuvres, and often not viable or even permissible. These choices do not reflect lack of awareness on the part of fishers, but lack of sustainable options. Development support should help improve the capacity of fishers to deal with issues on their own. Building upon strengths will be a core theme for this study.

While discussing approaches to sustainable livelihood diversification, the development community should beware of ignoring or underestimating the capacity of the fisheries sector to sustain livelihoods. Some questions need to be asked: Is marine fisheries unable to support livelihoods? Does everyone face a dire need to move out, and for good? Are some activities more vulnerable than others and what makes them so? If there is a need to move out, who needs to do so and who needs to remain? Perhaps most importantly, *who decides* such things?

The current study attempts to address some of these questions and present answers as fishers[2] articulated them. These are by no means conclusive, but are important in presenting a dimension that is often overlooked in the hurry to get people out of fishing. This is also necessary considering that most opportunities available in other sectors are already taken — or are not available to fishers without substantial investment and risk.

The study attempts to develop a detailed typology of livelihood enhancement and diversification strategies adopted by fishers. It assesses factors behind the different choices of fishers. It draws on the strength of the fisheries sector in supporting the livelihoods of different stakeholders as well as the asset base of fishers which enables them to diversify. The study seeks to assess the sustainability and equity implications of the choices using a range of indicators based upon DFID's Sustainable Livelihoods Framework. It then develops a framework for assessing options for livelihood enhancement and diversification in coastal fishing communities. It suggests some ways to strengthen ongoing tsunami-related livelihood initiatives and, more importantly, the strategies adopted by the fishers themselves.

Expected Outputs of the Study

1. A case-study based analysis of *factors influencing the choices of coastal fishers concerning livelihood enhancement and diversification* in southern India.
2. A *Livelihood Enhancement and Diversification (LED) Assessment Framework* aimed at development agencies. It applies SLA principles to information obtained from field work in selected villages and from secondary data review.
3. *An analysis of the ongoing livelihood diversification programmes in Tamil Nadu and Kerala using the LED Assessment Framework.*
4. *An assessment of opportunities to enhance the potential of livelihood choices made by fishers* (both ongoing and proposed) to contribute to sustainable livelihoods and economic growth.

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[2] *Meaning those with whom the study team spoke; broad generalisations about 'communities' and 'fishers' are always contentious and especially so in a study of this sort.*

Methodology

The study has drawn upon the Sustainable Livelihood Approach (SLA)[3] and ICM's past work (especially Salagrama, 2006a) on various livelihood issues concerning coastal fishing communities in India. Data collection for the study was done through three major sources:

i. Secondary data review

ii. Interactions (personal interviews and e-mails) with institutional stakeholders and experts on livelihood issues

iii. Field work in selected communities of Tamil Nadu, Kerala, Andhra Pradesh, and Orissa

The first two sources were initially meant to be quite broad-based. Ideas and options were to be tapped from beyond the geographical area and beyond the fisheries sector, so that many good practices could be absorbed. But this proved to be a tough task, especially because of the wealth of information within the sector itself and in the study area.

Field work consisted of two phases. In the first phase, detailed interviews and discussions were held at the village level. Interactions were conducted with the community to assess the current situation in fisheries and identify livelihood enhancement and diversification trends. In the second phase, case studies were undertaken to explore specific LED strategies in different locations. Fewer field areas were covered than originally planned, but a useful mix and match was organised between field studies and case studies.

A checklist for field work is presented in Annexure A. This must be revised, modified and developed at each place to suit the local context. But the broad themes are valid everywhere.

Geographical coverage

The study was to have focused on Tamil Nadu and Kerala, but Andhra Pradesh and Orissa were included as well to draw on the knowledge and understanding on livelihood enhancement and diversification in these areas. This broadened the scope of enquiry as well as its relevance. Examples have been drawn from a wide area, their relevance too is not merely local. The study began in the last week of December 2006, field studies were concluded by mid-February 2007. The analysis and drafting of the report took until mid April 2007.

Villages for field work were selected on the basis of work done by NGOs in these areas. For studying livelihood strategies, the best-practice areas of these livelihoods were picked. Important places covered for the study are listed in Annexure B.

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[3] *For a comprehensive treatment of the SL Approach and its various components, please refer to www.livelihoods.org*

Limitations

A study of this nature was being carried out for the first time, so the team needed to develop its own rules and guidance as it went along. It was decided early on to keep the inquiry open-ended to allow the facts to speak for themselves and enable an organically coherent conclusion. It turned out that though the idea is excellent in theory, it is not feasible in practice. Balancing theory and practice was struggle, so also the need to present the complexities of the issue simply and clearly.

The study was also perhaps ambitious in its scope, especially its time frame. Some of its original objectives could be touched upon only briefly. Consequently, some of the study's outputs (especially the LED framework) should be regarded as preliminary. On account of space constraints, only few case studies have been presented in this report; else, this report would easily be twice its present size.

Structure of the report

Chapter 2 gives a brief overview of different phases in the development of fisheries from a livelihoods perspective. Chapter 3 describes livelihood enhancement strategies in fishing communities during successive phases of fisheries development. Chapter 4 discusses livelihood diversification strategies during the same period, on the basis of secondary sources, key informant interviews and field work among selected coastal fishing communities of Kerala, Tamil Nadu and Andhra Pradesh. Chapter 5 discusses factors contributing to livelihood enhancement and diversification choices in fishing communities. Chapter 6 assesses the sustainability and equity of livelihood choices after the tsunami. Chapter 7 discusses some opportunities for enhancing the livelihood choices of fishers.

A Livelihood Enhancement and Diversification Assessment Tool is an important output of this project. It is based on brainstorming sessions held with a number of fishers, and on several case studies that are a part of this report. But it has been organized as a separate Annexure so that it doesn't impede the flow of the narrative, also because it is provisional in nature. But we suggest that Annexure D be read as an integral part of the main analysis, rather than as an independent entity.

Chapter 2: Overview of Marine Fisheries Development in India

From a livelihood perspective, one can distinguish three phases in the development of marine fisheries in India. The first of these is the **pre-modernisation** phase, which is characterised by typical pre-industrial production and economic systems. This phase ended with the onset of the **modernisation** phase, which began in the 1950s in Kerala (and took the next two decades – until 1970s – to spread to other states like Orissa on the east coast).

The third phase, referred to in this study as **post-modernisation**, is not a clearly definable process like modernisation, with effects that are not uniform across regions or in time. But the phrase serves as a useful discussion peg, because it refers to a complex process of change affecting everyone in the sector.

This study focuses on the last phase, But we will discuss the origins of different livelihood streams so that we better understand current livelihood enhancement and diversification strategies and their effectiveness.

Livelihood context in different phases of fisheries development

A. Livelihood context in the pre-modernisation phase:

The *technologies of production* in the pre-modernisation period were simple, indigenous, and not very efficient from an economic point of view. As one colonial report put it, although 'the Indian seas swarm with valuable fish', the traditional fishing practices 'bear about the same relation to British fisheries as a catamaran does to a steam trawler' (MFB 1915: 2-3). Similar complaints have been made about the inefficiency of the tools and techniques employed in fishing and post-harvest activities. Whatever the merits and demerits of such criticism, it is clear that that the capacity of the systems to catch and handle fish beyond a level was limited.

The capacity to produce more was also constrained by the ***poor local demand*** for fish. Women fish vendors were the main marketing channel; they carried fish by headload to neighbouring markets or to households from door to door. Obviously, their capacity was limited, so also their range of operations. Apart from practical difficulties in carrying fish on their head and walking long distances, they could not afford to stay away from home for long. Even in Kerala, which had a very well-developed fishing sector very early[4], a glut in the catches of sardines, mackerels and even shrimp[5] were a problem – the fish would end up as manure in coffee and coconut plantations. Conditions were much worse in states like Andhra Pradesh and Orissa in the 1970s and beyond, where excess catches of fish and shrimp had to be dumped in the sea or buried in pits on the beaches.

Thus, the pre-modernisation phase in fisheries was one of subsistence. At its simplest, it meant that fishers could catch only limited quantities of fish, part of which they retained for their consumption[6]. while the rest was sold by women in local markets in cash-or-kind transactions that helped families to meet their other needs. The technologies were indigenous and low-cost; the markets were local and not very efficient – a condition hardly conducive for investments. The fact that the social organisation of fishing in several areas actively discouraged capital formation (Thomson 1989; Schömbucher 1986) also acted as a disincentive for new investments. Even on the south-west coast where the fishing economy was quite strong, fishers themselves were almost uniformly poor (MFB 1916).

Seasonality was a critical factor in fisheries then as now. The so-called 'fish famines', which date back to the early 19th century, frequently drove mass migrations by fishers. Famine and drought prevailed in many parts of the country during the pre-Independence period. Considering that social security systems then were weak or non-existent, 'fish famines' must have been more devastating for fishers then than they have been for fishers in recent times.

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[4] *As early as 1909, it was already catering to markets in Sri Lanka, Southeast Asia, China, Japan, and even Europe with products like dried fish and fish maws, shark-fins, fish oil; see Thurston 1909: V-110*

[5] *In the 1940s, glut landings of shrimp were used as manure in coconut orchards (Kurien, 1985).*

[6] *Crewmembers were allowed to take sufficient fish for their consumption before sale (MFB, 1916: 53)*

B. Livelihoods in the modernisation phase

The need for comprehensive modernisation of Indian fisheries was articulated in the post-Independence period. A number of factors came together during the 1950s to give the process momentum – a balance-of-payments crisis due to heavy food import bills, the 5-Year Plan focus on self-sufficiency in food production and the choice of fisheries (along with a few cash crops) for exports, a spurt in global demand for shrimp close on the heels of the discovery of good shrimp fishing grounds in Indian waters.

Over the next three decades, the fruits of modernisation would reach every corner of the fisheries sector and radically transform its structure, orientation, and performance, and leave an impact on everyone in the sector. The dominant themes of the modernisation process were (i) improving technological efficiency to increase production; (ii) encouraging private and public investments into the sector through subsidies, favourable credit policies and promotion of the idea of the sea as 'open access'; and (iii) export market orientation. Together, these would change the livelihood-oriented, inward-looking fishing economy[7] in coastal areas into a vibrant capitalistic system with an overt commercial orientation and a global focus.

The three outstanding production technologies that modernisation brought into existence were: (i) mechanised boats, which became synonymous with trawling mainly for shrimp; (ii) motorised boats. Initially, wooden boats were motorised; later, intermediate varieties of boats of Fibre-Reinforced Plastic or FRP and plywood, were introduced. and (iii) brackishwater aquaculture (again for shrimp).

The new technologies required new and often very large investments that cash-starved fishing communities could not have afforded — but for the generous support they received from the government and, later, from the private sector. The government became a major player in the development of fishing communities – through fishing inputs and infrastructure, and less directly through the formation of cooperatives. More importantly, in order to promote modern technologies and increase production, the government also encouraged the idea of the sea (and other coastal/estuarine waters) as open access, ignoring the existing communal arrangements that controlled entry and use rights for different groups of fishers.

For an average fisher, modernisation may have meant access to more efficient technology, but this could not have taken root without a change in the market orientation. This was provided by the emphasis on exports and, later, on inter-state markets.

From the personalised one-to-one, cash-or-kind transactions carried out by women headloaders, fish trade became a globalised activity[8]. Fishers – or their wives – did not any longer need to go searching for potential buyers; the buyers came to the landing centres with their own transport and preservation systems. They paid very well and were generous with 'advances' and other support to get assured supplies. Shrimp was the focus of attention in catering to export demand and the growth in fishing harbours, processing plants, preservation and processing systems owed largely to it – or at least to the demand for it in international markets. This process of building up a whole sector based upon a single commodity was as remarkable as it would turn out to be risky. Although both the local fresh fish trade and the processed fish trade (in dried/salted fish) continued to flourish during this period and remained firmly and largely in the hands of women, their activities were no longer as important to the fishing economy as when the women were the sole channel for selling the fish.

In the modernisation phase, the vulnerability of fishers did not go up, it was constant — given the overall growth in the economy and the many new opportunities for people to take up. They could cope relatively better[9]. In coping with shocks like cyclones, which had a major impact on the physical asset base of fishers, the role of the government became very important. It had by now developed a major stake in fisheries, it was a major generator of foreign exchange revenues.

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[7] *This is truer of the east coast than the west coast, which, as we have seen, had much earlier acquired a capitalistic orientation with global reach.*

[8] *Long before, it must be added, the idea of globalisation became a hot issue.*

[9] *This is obviously an oversimplification because evidence shows that the poor would continue to be subject to such hazards irrespective of the economic conditions in the sector or in the macro-economic context.*

C. Livelihood context in the post-modernisation phase

The post-modernisation phase marks a period of crisis in fisheries. The negative implications of the modernisation phase became apparent and started exerting a negative influence on livelihoods. It is difficult to fix a possible starting date for this phase, because the processes that define this period showed up by the early 1980s in some states like Kerala, while they became visible only much later in Andhra Pradesh and Orissa[10].

Further, in a complex, multi-species-dependent, globalised occupation like fishing, things seldom remain the same over the years. This means the influence of a crisis on a group of people varies with time. It seems reasonable to take the 1990s as the defining period in this phase. Issues such as fish declines, mounting investment needs and market fluctuations came to the fore, coinciding with major macro-economic changes such as massive economic liberalisation and structural adjustment programmes at the national level and the establishment of new global trade regimes under the aegis of the World Trade Organisation (WTO).

The collective impact of such changes can be summarised as ***diminishing access*** for different stakeholders in fisheries to resources, technology, investments, and markets. Put simply, it meant diminishing access to sustainable livelihoods for people at all levels in the sector. The use of the phrase 'diminishing access' (rather than 'diminishing availability') is important here. It also raises the critical issue of equity, which could well be a more important manifestation of the crisis than the **physical** non-availability of fish or fishing tools.

The broad processes characterising the post-modernisation phase can be discussed under three headings: (i) access to fisheries resources (ii) technology and investment issues; and (iii) trade issues. Collectively, they affect not merely the livelihoods of people, but more disturbingly[11], the ***capacity*** of the sector to sustain the livelihoods of the fishers. These issues are discussed in the following paragraphs.

Access to fisheries resources

Dwindling fish catches cause great concern. The decline shows up in many ways. Common indicators provided by fishers: overall decline in fish landings in an area, lower catch-per-boat, increased landing of juveniles, uncharacteristic fluctuations in seasonal availability of fish[12], changes in species composition in an area, and disappearance or decline of certain commonly harvested species. What are these trends due to? Answers vary, depending on (i) the 'location' of fishers in the system[13], (ii) the preoccupations of the scientific community and its members (iii) the priorities of the government (which has not really managed to resolve the inherent contradictions in its objectives of economic growth, livelihood support, and environmental sustainability).

While the role of natural causes in resource depletion can't be ruled out, three phenomena — competition, destructive fishing and over-fishing — have also played a major role. The surpluses from fishing – and the loans that the government and the private sector made available to fishers – were invested in enhancing fishing capacity and efficiency. Result: the numbers of boats of *all* varieties increased manifold.

Maximising returns soon became a ***necessity*** in the face of mounting investments. Fishing therefore began to focus on some high-value varieties (mostly in near-shore waters) leading to their overexploitation – very apparent from the decreasing sizes of commercial species like shrimp, shark, and seerfish in the catches. Boats frequently resorted to harmful practices (such as fishing in sensitive areas, using smaller-meshed nets, blocking migratory paths). Many research studies reported large-scale landings of juveniles

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[10] *This could be a result of the time lag in the introduction of the modernisation process in different states.*

[11] *Disturbing, because this concern directly gives rise to two responses: firstly, it leads to stringent management measures which seek to further curtail access to the resources for the fishers; secondly, it gives rise to a blanket preoccupation with finding 'alternative income generation' avenues for the fishers, irrespective of whether they needed them or not.*

[12] *This gives rise to frequent instances where the unexpected availability of bulk landings of fish would become as much a matter for concern as their non-availability in the expected seasons.*

[13] *Thus, for instance, the mechanised boat owners blame shrimp-seed collectors; artisanal boat owners blame their counterparts in mechanised sector; people in capture fishing blame it on aquaculture fishers and vice versa; the capture and culture fishers together blame it on agricultural/industrial pollution or some such externality, everybody blames the government, the government blames... and so on.*

in fisheries on the west and the east coasts. Modern technologies such as trawling and coastal aquaculture not only depleted natural biodiversity but fell victims to such destruction themselves. Competition and conflicts increased as different fishing systems scrambled for control over a limited resource, and over-fishing by both mechanised and artisanal fleets was as responsible as destructive fishing in aggravating the problem.

However, as we suggested, while the decline in ***availability*** of fish is a matter of great concern, it is just ***one*** aspect of a more complex issue. The other important aspect, which is much less recognised, relates to decline in ***access*** to fish for everyone, especially the poorer people. In a context where demand far outstrips supply, and supply itself is uncertain, fishers need either money or superior technology to access fish. The poorer stakeholders lose out at sea (where the winners are boats using sophisticated and efficient systems) lose out on the shore (where competing supply chains reduce their access to fish), lose out in the markets (where fish are too expensive to buy).

That more fish does not mean better access to fish is best illustrated on the Coromandel Coast, where there has been a tremendous increase in the availability of small pelagics (sardines, mackerels, horse mackerels) after the tsunami due to the proliferation of ringseines. Considering that small traders in the area (mainly women fish sellers) depended upon these fish for their trade, one would normally expect that bulk landings of the fish would mean higher incomes for the women.

But this did not happen. Bulk landings of these fish immediately attracted the attention of the large merchants from Kerala. They sent insulated vehicles equipped with ice to wait on the beaches; fish were immediately loaded on landing and taken away. Women could not bid for the fish because the economies of scale did not encourage trade in small quantities, even if the women were willing to pay a higher price.

The ringseines are said to practically sweep fishing grounds clean. Other boats can't catch these fish any more, so the women can't buy from these boats either. In other words, the catches of sardines, mackerels and horse mackerels may have increased manifold as a result of ringseines, but access to them at sea and on shore has been limited to far fewer people than before. We shall return to some of these issues in Chapter 7.

Technology and investment issues

Overcapitalisation of fishing has been the most important feature of the crisis because of the high levels of investments made in capital assets and the mounting operational costs to keep the fleets gainfully employed. As long as production went up with additional harvesting capacity, all surpluses were reinvested to step up fishing capacity or efficiency. When the harvesting efficiencies increased beyond the capacity of the natural systems to yield commensurate returns, fish catches levelled off or declined. Strong market demand offset the shortfalls for a time and even encouraged ***further*** investments as a means to make good on the losses. However, by the late 1990s, the international demand for shrimp started fluctuating; the fishers found themselves in a riding-the-tiger syndrome. They couldn't dare to get off.

The trouble with new technologies was that they infused into fishing operations an element of financial risk. Increasingly, boat owners were reluctant to venture into the sea unless they were sure of getting their investment back. Result: the number of active fishing days started to decline. The reduction in subsidies – especially for fuel – meant a major setback to modernisation technologies, which increasingly depended for viability on subsidies. With every new hike in the price of fuel, a number of boats slided into the sick category. In Nagapattinam, many boats were permanently docked. A few of them had actually been dismantled for their wood, when the Government of Tamil Nadu enhanced diesel subsidies and gave them a fresh lease of life to them.

In other states such as Karnataka and Andhra Pradesh, where there was no hike in subsidies, up to a third of the boats were always docked and many owners resorted to distress sales. An important reason many post-tsunami FRP boats idled away for months was that fishers couldn't afford the fuel to run them.

High costs in the sector led to rampant indebtedness. This reached a stage where the chances of full repayment of loans by some borrowers were very slim. All they could do was to pay the interest, or turn over the boats to financiers and hope to be able to repay the principal some day. In the mechanised and

aquaculture sectors, many people found it cheaper to avoid operations altogether than be active and risk sliding further into the debt trap. Even if the gamble of going out to sea worked and they caught fish, they hardly earned enough to repay old debts; if the gamble failed, they got sucked into still deeper debt.

The need for high investments thus meant that ownership of production tools (boats, nets) got confined to fewer and fewer people. Trader-intermediaries often became the ***de facto*** owners, although there were few takers for such an arrangement. For many boat owners, working as crew on others' boats – or even leaving the area to seek work elsewhere – became more attractive options than running their own businesses. Meeting the requirements of HACCP and other quality standards in the export processing industry needed major investments – and this bankrupted a number of businesses. Even if some companies upgraded their systems, they couldn't obtain investment for procuring the raw material and ended up being leased out. Processing plants that could not afford the investment to upgrade simply folded up. This development streamlined seafood processing and export. Control over it was concentrated in much fewer hands.

The condition of private investors was not that great either. Most of them invested so heavily in the sector that they could not get out any more. This put them in a Catch-22 situation. To recover their investments, they had to keep making fresh investments. If anything, the economic impact of the crisis was more serious for these trader/intermediaries than even for fishers, who – as one fisher told the study team – could at least revert to non-motorised catamarans and start fishing with practically no investment[14].

The point is that irrespective of whether fish are available or not, the cost of operations has become the most decisive factor in the economy. It affects virtually every aspect of production, processing, and trade, and almost everyone in the sector – men, women, children, and the old. It makes several activities simply unviable. With boats idling for days, under-employment increases in villages and women become breadwinners, sometimes more out of compulsion than choice. Catches at the local level becoming uncertain, fish sellers have to travel to larger landing centres, adding to their costs and reducing profitability.

Given the intense global debate on controlling and regulating subsidies in recent times, the issue of operating costs is likely to become more serious in the years to come.

Trade issues

The troubles in the sector grew in intensity when the main seafood markets (the US, the EU, and Japan) began to object to Indian shrimp because of: poor quality control systems; environmental implications of fishing methods (for instance, their impacts on turtles); use of antibiotics in production systems; muddy smell; and even dumping. The gravity of the glitches with international trade can be gauged from the fact that beachside procurement prices for shrimp in 2006 were less than the prices paid for them a decade ago. The impact of trade measures was also felt by women in Kerala – thousands of them lost jobs because of the closure of peeling sheds.

The shrimp-orientation of some of the activities – mechanised fishing, brackishwater aquaculture, processing and export – plus ancillary services such as shrimp hatcheries, feed mills, packaging material, refrigeration services, do not easily permit diversifying into other species. This meant that shrimp producers had to bear the full brunt of the shrimp-related trade measures and even invest sizeable sums to keep pace with fast-changing global trade. Even small-scale fishing economies which depended on shrimp for surplus generation, suffered as a result of trade fluctuations. The uncertainties in global markets and the presence of intermediaries in supply chains kept the stake of primary producers in markets falling throughout the decade.

Anyway, as we shall see, markets became more stable over time. Different players in the sector reoriented their activities from shrimp and exports to other fish and to a wider range of consumers. This shift reduced risks and perhaps made the sector more robust and economically sustainable. But this may have been at the expense of poorer producers, traders, and local consumers. They have faced increasing competition at landing centres, aggravated by the fact that more women are entering the sector because

[14] *Several fishers in Andhra Pradesh are doing it already. If more are not, it's perhaps because their conditions have not yet forced them to do so.*

of falling household incomes. The conditions of women-headed families, which constituted up to a fifth of the households in a community, are particularly difficult.

Major livelihood groups in fisheries

A. Pre-modernisation phase

The fishing economy in the pre-modernisation phase was largely self-sustaining, but it hardly generated any surplus to support many livelihood activities. When even those already in the sector had trouble keeping themselves employed, the opportunities for new people to enter were very few. Short market supply chains (confined to local areas) and short cycle times (dictated by the perishability of fish) allowed scope for few intermediaries.

Key players during this phase were men fishers, women traders and processors, ancillary workers and artisanal workers (both fishers and non-fishers). There were a few other traders too in the business – fish vendors from non-fishing communities[15] and dry fish traders from the interior areas. In Malabar, men played a big role in distributing fish quite widely; they even acted as relay runners to convey fish over long distances (Thurston, 1905, V: 109). However, fisherwomen were more numerous and prominent in market chains and managed to retain the position even after the activities became more monetised and fish trade became an independent activity from fish production. This was because of the strong support they received from the producers.

On the south-west coast, fish trade and fish curing were largely controlled by people from non-fishing castes (who included many upper-caste entrepreneurs) who dominated the sector and employed fishers – both men and women – as daily wage labourers in processing activities. The role played by this trading class in the fishing economy appears to have been quite exploitative and responsible for the widespread poverty in fishing communities.

On the east coast, fish curing was done largely by fishers themselves, and labourers were rarely employed. In several places, the trade was 'obviously too small to attract capitalists or middlemen' (MFB, 1916:126), although there is evidence that people from outside did act as fish merchants, owners of fish curing businesses, or moneylenders.

B. Modernisation phase

An important point about the modernisation process is that, while it did marginalise – or make redundant – some traditional livelihood activities, it also spawned many new opportunities in the sector. The shift to a capitalistic mode of production, with long supply chains stretching across continents, generated considerable surpluses. These opened up avenues for a number of new intermediaries in the sector. New players like commission agents, company agents, and wholesale merchants emerged, many of them from within fishing communities.

There was also much in-migration during this phase: the newcomers invested in mechanised boats and later, in short-lived 'deep-sea' vessels. They were initially spurred by the attractive incentives that the government offered, later they came on their own. Outsiders also invested sizeable sums in the supply chains driven by exports and urban markets — as traders, transporters, owners of processing plants and other ancillary infrastructure (for e.g., ice plants), and exporters. A number of bicycle fish vendors and women from non-fishing communities found openings in the local fresh fish trade. There were apparently not many openings for outsiders in dried fish production, but a number of intermediaries did exist in the trade.

In all fish landing centres, and more so in fishing harbours, a number of new livelihood groups emerged. Many new people entered the sector. Shrimp processing provided opportunities for girls from fishing villages; but later, girls from non-fishing communities too joined in. Since the shrimp and fish went everywhere, within and beyond India, the supply chains saw a large number of players. But despite this massive influx of people into the sector, actual fishing activities remained largely in the hands of 'caste' fishers.

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[15] *The men carried fish in baskets slung from a pole carried on their shoulders. This system would later give way to the bicycle fish vendors.*

Prominent among the outsiders who promoted modernisation technologies and helped develop new market chains, were trader-entrepreneurs from Kerala and Tamil Nadu. They visited almost all major landing centres in every state on the east coast of India. These itinerant merchants took great risks and single-handedly helped establish shrimp and other market chains even in the remotest fishing villages. But they remain sadly forgotten in fisheries literature.

Modernisation gave rise to a number of ancillary activities. These provided opportunities, especially to youngsters. In many villages, several new players appeared in the sector: *skilled workers*, like FRP boat-makers and engine mechanics; *suppliers of materials*, like engine spare-parts sellers, fuel and ice sellers; *suppliers of labour*, such as ice crushers and transporters[16]. The growth in the fishing economy also improved the economic conditions in an area and supported several other livelihood activities.

Although the modernisation process was male-centred, and aggravated marginalization of women, it also gave them new opportunities — as ancillary workers in shrimp processing, as fish transporters from landing centres, as auctioneers and resellers on beaches, and as net-menders. Some of these activities provided jobs to thousands. While it is impossible to compare the numbers of new jobs with jobs lost, it is apparent that but for modernisation, a vast number of people, many of them poor, would have been unable to make a living from the sector. We shall revert to this in Chapter 7.

C. Post-modernisation phase

The post-modernisation phase does not add new entrants to the sector. But those active in the modernisation period continue to serve. A quick summary of different livelihood groups encountered in the sector is presented in Annexure C. It lists some 85 categories.

An interesting point about livelihoods in fisheries is that the participants can be classified according to their caste, geographical origin, gender, age, and socio-economic characteristics. This clear division of labour by several criteria enables a vast majority of the poor to make a living from it.

On the other hand, a majority of livelihood groups in the sector remain 'invisible' to outsiders, and therefore unable to tap external support when necessary. To illustrate, one could compare the livelihood groups targeted by the development community after the tsunami with all groups in the sector.

[16] *The sector also earned enough to support a few people in every village who did not add any apparent value to the processes, but still managed to make some money out of it. A good example would be the fish resellers on the beaches who simply bought fish from the fishers and sold them right there to a trader and pocketed a small profit.*

Chapter 3: Livelihood Enhancement Strategies in Coastal Fisheries

A. Livelihood enhancement strategies in pre-modernisation fisheries

In the pre-modernisation fishing economy, which was plagued by poor incomes, uncertain tenure, weak supply and demand, low investment potential, and seasonal nature of activities, strategies for livelihood enhancement and diversification sought to safeguard the existing order rather than improve conditions. People's access to assets and institutions was erratic and uncertain. It was more important for them to improve this access than seek to maximise incomes.

Common to the systems of organisation (social, economic, political) in this phase was the emphasis on stability (economic and social) over profit maximisation. A quick survey of the pre-modernisation phase comes up with a range of strategies. An analysis of these strategies shows how fishers drew upon their strengths – 'asset base' – and even managed to convert some of the compulsions imposed upon them by the sector into strengths.

Ensuring access to natural resources

The fishing economy was based on the open-access nature of the resource. Access to it was marked by competition and perpetually contested use-rights. As Thomson (1989) suggests, fishers cannot enforce a permanent individual claim on communal fishing grounds/territories because the costs of enforcing such rights are more costly than the benefits from fishing. Second, fishermen have to stay together not only to enforce claims on communal fishing grounds but also to organise themselves in various production teams and obtain a share in the benefits. A 'social contract' thus comes into existence to address the need for the collective to assert viable claims over fishing grounds, and ensure equitable access to all fishers in the collective.

Governance system

Analysis of this collective governance system will highlight the role of an important institution in the traditional communities: *caste*. In a context where fishing was (and, largely, still is) a caste-based activity, and being an outcaste was the most severe form of punishment for anyone, it made sense to develop the governance systems along caste lines.

When caste becomes the determinant of access to resources, entry for outsiders becomes difficult, if not impossible. The case of *dalit*s and cycle fish-vendors from non-fishing communities is a good example: they may have been into fisheries-related occupations for generations, but they can never lay any direct claims to the resources. As discussed later, this continues to be a major source of strength for fishers: they can always go back to fishing which is considered their inalienable right.

However, restricting access along caste lines does not address the problem of competing claims to the resources from other communities *belonging to the same caste*. With estuarine communities, the issue was rather straightforward: physical boundaries to fishing grounds were recognised and adhered to. In the open-sea based communities, where boundaries were less easy to designate or implement (except in case of shore-seines), the problem was resolved by the principle of *reciprocity*: allowing access to fishing grounds on a quid-pro-quo basis.

Bavinck (2001) suggests that, in the open sea fishing systems, 'Not only do all artisanal fishermen benefit from reciprocal access, but they also benefit equally. The similarity of fishing technology in the artisanal sector provides each participant with a more or less identical point of departure. In conjunction, reciprocity and equality remain important clauses in the artisanal fishermen's rule of open access.' This acceptance of reciprocity and equality is the organising principle behind a majority of geographical migrations undertaken by the fishers on the east coast of India, because it was valid across different fishing castes in a wide geographical area and was ratified and supervised at the level of supra-village councils.

At least one other mechanism aimed at avoiding competition and ensuring access to the fishers to their resources can be observed in pre-Modernisation fishing communities. This was:

Specialisation

As John Kurien (2005:75) notes, 'the only real wealth of the fishers was their phenomenal knowledge of the sea and its resources, and their modest collection of fishing equipment'. This knowledge gave rise to the development of a variety of fishing boats and nets for targeting fish in different ecological contexts. Each boat – and the complement of nets it carried – suited a particular environment, which effectively restricted its operations to certain areas. Similarly, within a village, a number of different fishing gears – and ways of using them – were devised in order to reduce intra-village competition.

Gear specialisation is particularly important in confined spaces like lagoons, backwaters and estuaries. Fishers in villages abutting the lower (estuarine) reaches of the Godavari in Andhra Pradesh, for instance, used seven different fishing methods, each unique in operation. Each of the different fishing systems is adapted to a particular niche within the estuaries, and the shallow waters permitted use of several of these nets without the use of a boat. Some of the fishing methods did not even require a net, and were carried out with bare hands – the collection of mollusc shells and catching catfish being two examples. This enabled the use of several fishing gears simultaneously without necessarily competing with one another.

Such specialisation also existed at the inter-village level. In the same Godavari area, fishers of a particular village specialised in catching mud-crabs, while another group specialised in catching mollusc shells. Some villages in every region have a reputation for particular types of fishing – hook-and-line, for instance – and they are known to safeguard it zealously.

Organisation of fishing and fish trade

In a context where the scope for investment or profit maximisation was limited, optimising costs was one way to ensure viability. The dependence on open-access resources was, as discussed above, a cause for concern because it led to competing claims for access. But it also gave the resource-poor a livelihood opportunity without paying an access fee. This phenomenon influenced the choice of (i) technologies for production, (ii) organisation of production and trade related activities, and (iii) social organisation to support the economic activities.

Technologies of production: 'focusing on the local'

The tools of production had to be necessarily local, just like the markets. While this meant that the technologies were not efficient enough to maximise returns, they were low-cost – some of the crafts like log-catamaran hardly cost anything to make — especially as timber for boat-making was freely available in some regions, and did not entail any risky operational costs. The local origins of the technology had at least three other strengths:

They took the peculiarities of the local ecological, biological, social, and economic context into consideration and, in fact, tried to build upon them, giving rise to the so-called 'ecosystem-based practices' much before such ideas were widely known. This also led to a vast diversity in terms of fishing and fish processing techniques that varied from place to place depending on the geo-morphological characteristics of the ecosystems in each location. The evolution of some unique fish processing techniques like '*masmeen*' in the Maldives and fish smoking in Andhra Pradesh, which depended on the local availability of natural resources like coconut husk and mangroves, are good examples of the importance of the 'local' in the pre-modernisation phase.

Second, the dependence on the local gave rise to – or at least supported – a local artisanal class that specialised in catering to the needs of fishing communities. Local carpenters specialised in building boats, local basket weavers specialised in making a host of items necessary for fishing and the fish trade, local rope-makers wove ropes for fishing purposes, and local salt-makers made salt for fish curing. This access to local resources helped smooth operation of activities. It also brought about an inter-dependence that helped both the people and the activities.

Finally, to cater to their specific needs, fishers themselves undertook a range of activities – boatbuilding or making nets, ropes and sails. This kept costs low. It also stood them in good stead whenever they migrated to other areas like Burma or Malaya or, in more recent times, Gujarat or the Middle East.

Organising production activities

An analysis of traditional fishing economies will reveal two important strategies to enhance the effectiveness of activities by building upon available 'assets':

The first strategy relates to the fact that fishing essentially developed as a *household-based* activity with men fishing, women trading in fish or processing the leftovers, older people involved in a range of ancillary employments: making and mending nets, maintenance, and repair of boats. Older women also took the responsibility of carrying fish for sale. Children played a role in sorting catches, launching and hauling boats, bringing provisions, and (in case of girls) helping in fish processing and net making.

Household-based work improved activity efficiency and minimized the impact of failure by any member to earn. Gender-based division of labour was necessary because the men had to spend considerable time away at sea; Women therefore had to take on a multiplicity of roles: as traders, as managers of the household economy, as caretakers of the family and, even in some cases, as fishers. They had to take on additional responsibilities now and then, during lean periods. But it is as fish traders that their role was the most important.

The second strategy was about employing kins as boat crew. The fishing equipment itself was quite rudimentary and low-cost; ownership of assets was not a privilege confined to a few. However, getting a sufficient number of people to operate the boats was more difficult. Employing one's kin as crew helped to overcome this problem and retain a larger proportion of the catch within a family. Large families were thus an asset in pre-modernisation fishing communities; they could be tapped to maximize wealth. This was the reason for the *large families* in fishing communities.

Ensuring market access

Like other door-to-door vendors, fish sellers carved up the streets and households in an area in such a way that the same seller would service particular households regularly. Households habitually bought from particular sellers. This practice helped avoid competition. It was further reinforced by the practice of payment on credit and, frequently, in kind. Agrarian clients for marine fish preferred to pay in kind. Cash was (and, in some places, still is) in short supply; it was easier for housewives to pay in the form rice or other agricultural produce. The women fish sellers accepted such payment, it saved them the trouble of having to buy commodities in the market, and also assured them of future patronage – a marketing strategy that still remains valid in places like Chidambaram.

The other important mechanism to avoid competition was that of specialisation, i.e., focusing on niches that were not claimed or occupied by other potential competitors. The palmyrah basket weavers in the coastal fishing village of Uppada in Andhra Pradesh made several items useful in fisheries: baskets for carrying fish, food carriers, hats as sun shields, mats to spread fish on, ladles to bail out water from boats, baskets for fish storage and transport. They got business from villages within a radius of about 20 km from the village. Other basket-weaving communities in some of these villages focused on making baskets for other purposes, not for fishing. This helped avoid competition and ensured regular work for everyone.

Social organisation to support economic activities

Perhaps the most important strategy adopted by the pre-modernisation fishing communities was to develop a social system that closely paralleled and supported the economic systems. Since many fishing activities required group effort or at least the approval of the larger collective, much emphasis was placed on fostering, reinforcing, and continuously drawing upon *'social capital.* Internalising such costs could have seriously impaired the viability of fishing as an economic activity.

As we have seen before, a community's claims over a resource were consolidated with the organisation of a caste-based governance system, whose other important role was to maintain the existing socioeconomic and political order in the village, which was crucial to ensure equitable benefit flows from the exploitation of the common resource.

The egalitarianism inherent in the system had less to do with philanthropy and more to do with practical sense: in a system where a majority of people were poor and regularly affected by seasonal and long-term

deprivation, people needed to draw on one another during periods of crisis, especially as their integration with the larger world was very limited.

This egalitarianism was also gender-biased: the social structure was preoccupied with organisation of the fishing activity, which meant that it came to be entirely male-dominated (although in some major fishing communities like the *Vadabalija*, women did have a role in the system), ignoring the critical post-harvest role that the women played, although non-representation did not necessarily mean non-participation. Still, this oversight would come to haunt them in years to come.

The close-knit organisation *within* the fishing communities was in stark contrast to their virtual isolation from the rest of the world. In many ways they were indeed the 'outliers' (as John Kurien calls them). Except for trade – fish moving outside and other necessities coming in – there was hardly any contact with the outside world. Fishing and the castes that practiced it ranked low in the caste-hierarchies and the agrarian communities in the neighbourhood tended to avoid them to the extent possible.

The impacts of such isolated existence are still clear to see in terms of differences in cultural, social, economic, and political spheres. All the same, it can be argued that this isolation also acted as a bond in keeping the fishers in close-knit groups, helping them to draw upon one another at times of need and in emergencies like cyclones. It would also be quite important when the fishers ventured into new areas for long-term settlement (like the fishers from Andhra Pradesh going to Puri in 1940s, to cite just one example). The fact that migrations could take place across vast territories owed to the social networks and strong links that existed between the 'pioneers' and their communities.

Coping with vulnerability

Seasonality was a key factor of vulnerability for fishers. Cyclones and other natural disasters, fish famines and drought conditions – all these resulted from seasonality. The strategies for coping with the effects of seasonality were diverse:

*i. **Organising fishing operations to synchronise with seasonal variations***

On the basis of 1956 data, Thomson (1989:75) provides a good example of how fishers in Colachel, a coastal fishing village on the west coast of Kanyakumari, had to use a combination of four different fishing gears at different periods of the year to survive. Taken individually, none of the gears could be used throughout the year, because no single gear was able to catch the different species available at different parts of the year. The combination of two or more gears at particular times of the year addressed the fishers' need to be able to fish round the year adequately.

Discussing seasonality in the context of *Pattinavar* fishing communities in Pondicherry, Bharathi (1999:38-42) draws similar conclusions. The result was, as Thomson (p. 79) suggests, 'The selection of these processes synchronised perfectly with seasonal variations and maintained the ecological harmony of the social system'. Some 22 craft and gear combinations were employed at different periods of a year in Kerala to overcome seasonal variations (Kurien, 2005:75).

This is true for most fishing operations on the east and west coasts: unless conditions are too rough to venture into the sea, most artisanal operations are carried out every day. The fishers classify fishing seasons into three depending on the effectiveness of operations: good, average and poor. The 'poor' season includes the off-season, but fishers contend that whenever conditions permit they fish during this season too in the hope of meeting at least their subsistence needs. They most often do manage to catch something for the family pot. There is no doubt that such a system was in operation in the pre-Modernisation period as well.

*ii. **Dried fish: A compulsion turned into an opportunity***

The perishable nature of the fish and inability to sell large quantities because of limited mobility meant the communities had leftovers in the form of surplus catches. Fish traders too came back with some proportion of their catches unsold. This gave rise to the custom of building a certain amount of loss into every transaction and working out the economics based on that assumption, in areas where both procurement and trade activities were fully monetised, for e.g., on the south-west coast . It meant learning to live with losses.

The problem of disposing of the unsold fish was handled by drying the fish for long-term storage. Drying required no investment – and there was hardly any technology involved in it – and the women could do it easily and within the villages. In due course, dry fish would become an important trade commodity, especially in inland markets, and develop its own production and market channels. Concerted efforts were made by the colonial administration to improve the quality of production by hook or crook (a legacy that haunts the activity till date, with no conceivable benefits to anyone!). For fishers, however, dried fish had a critical livelihood implication — it helped them overcome the critical constraint of lean periods to certain extent. During lean periods, women would use a part of their dried fish reserves for household consumption and sell the surplus in small quantities in exchange for other essential commodities.

iii. Sharing patterns taking account of lean seasons

In the traditional sharing pattern in several communities, the catch was distributed according to a basic pattern in which every member of the fishing unit received one share and two shares went to the boat and net. This meant a higher income for the owners, and perhaps greater security during the lean seasons. However, as Schömbucher (1986:247) suggests, the surplus income was expected not only to pay for maintenance of the productive assets, but also for redistribution to crew members 'to survive the off-season'.

This took the form of a 'loan'[17] paid to the crew member at the beginning of a fishing season. But Schömbucher suggests that the loan was actually a 'lost subsidy' on the part of the owners and another share on the part of the crew member, because the crew member did not need to repay the loan and received a fresh 'loan' every year. The 'loan' bound the crew member to work on a particular boat for a year, but even this was not a compulsion: he had the freedom to repay the loan any time he chose in the course of the year and shift to another owner.

In other words, a part of the surplus invested with the owners as their share was used to pay crew members to help them overcome the lean season. Although motorisation changed the rules of the game and dispensed with fresh 'loans' every year, the boat owner is still obliged to pay crew members some allowance for the period that the boats could not go fishing.

iv. Trader advances as a means to overcome lean seasons

This also brings into account the much-debated issue of 'advances' from fish traders and 'curers' in the pre-modernisation period and which continues in many ways till now. Thurston (1909: V-110), while discussing the *Mukkuvar* caste, has this to say: "The fisherman is sometimes also the curer, but usually the two are distinct. The former disposes of the fish to the latter 'on fixed terms to a fixed customer' and 'looks to him for support during the slack season, the rainy and stormy south-west monsoon'".

There is also evidence of 'advances' being made to fishers by fish merchants and 'curers' in return for an assured supply of fish (MFB, 1916), both on the west and east coasts of southern India. These advances would have served the consumption needs during the off-seasons. The point to make here is that the system of 'advances' – either from the owner to the crew or from the traders/intermediaries to the owners – was originally meant to address the consumption needs of fishers during lean periods. It was only during the motorisation period that their focus shifted to investments in productive assets (for which there was no great need for investment in the pre-modernisation phase).

v. Drawing upon 'social capital'

Recent work on access to credit for poorer groups in fishing communities shows that a large proportion of loans were in the form of 'hand-loans', i.e., short-term borrowings from friends, neighbours and relations, a clear manifestation of the strong 'social capital' element in the communities. Similarly, the strong social networks that fish sellers in some areas developed with the households in

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[17] *There is a distinction between 'advance' and 'loan' in the fishing context; while advances related to payments that will be recovered from the earnings (in cash or kind) of the recipient, loans referred to cash transactions without involving a trade/employment link – the borrower repays the loan as cash along with interest.*

neighbouring agrarian communities also helped to obtain 'loans' in kind – rice and other foodstuffs, which the women would repay in kind whenever fishing season improved.

Most importantly, local moneylenders frequently built some slack into the time frames for making the recovery, allowing fishers to avoid repayment during lean periods without being penalised. Going by current practices in many fishing villages (for instance, on the Coromandel Coast), it is possible that sellers of goods and commodities to the fishers accommodated the seasonal lean period into their operations and allowed extended credit facility to the fishers.

B. Livelihood enhancement strategies during the period of modernisation

Accounts of the modernisation process often give the impression that the role of fishers in it was limited, confined to being passive recipients of new ideas and technologies[18]. Certainly, the way modernisation was packaged and presented to fishers (it certainly was an offer they could not refuse!) was a crucial factor in its uptake. But fishers embraced the new technologies quite enthusiastically – and with reason too – once they overcame their initial fears and inhibitions[19].

As we shall see, the changes in the sector were reflected in the way people responded to them, by making appropriate adaptations to their asset base, sometimes practically rewriting the rules, in order to make the most out of opportunities.

Building upon open access

Increased effort led to better returns which led to greater investments. Result: a phenomenal increase in fishing boats throughout the period of modernisation. The notion of open access to the sea and its wealth – although it went counter to the traditional fishing ethic – came handy for fishers. Their new boats allowed them to travel long distances and fish more intensively than before; this automatically brought them into conflict with local fishers wherever they went.

An outstanding example of such confrontation was that between the mechanised sector and the artisanal sector during the mid-1970s in Tamil Nadu. It ended with a sort of acceptance by all parties of the principle of open access, also of the government role as a dispute adjudicator (Bavinck, 2001).

The mechanised sector - artisanal sector conflicts played out for a longer period in Kerala (Kurien, 2005) and for a shorter period in most other states. There was also evidence of such confrontations occurring within the artisanal sector itself – between non-motorised and motorised boats and even between two sets of motorised boats hailing from two different areas. Once again, the notion of open access was used by the superior group to justify their right to fish anywhere. Thus, when motorised fishers from north coastal Andhra Pradesh attempted to set up a migrant settlement on the banks of the Godavari delta in the early 1980s for fishing in the Bay of Bengal and faced stiff resistance from the local community (which contended, rightly, that there was no reciprocity arrangement between them), the migrants went to the local police who had to intervene and support the migrants' right to fish anywhere they chose.

The resistance of the local motorised community of Machilipatnam to the entry of motorised boats from northern Andhra Pradesh too were resolved along the same lines, even involving the political class in the process.

What emerged from these disputes was that a section of the fishing communities had developed a stake in the open-access realm. The law had to be invoked to settle any disputes. It was only when the principle of open access was used to introduce a superior technology – deep sea trawling – that it faced opposition[20].

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[18] *Obviously, it suited both the promoters of the process as well as the sceptics to limit the role of the fishers: this helped the former to garner all credit for its success, while the latter could absolve the fishers of all responsibility for its shortcomings.*

[19] *There certainly were many objections, some of them quite serious and, as it turned out, valid, but these were dismissed as evidence of the 'conservative' nature of the community.*

[20] *Even here, the issue was presented in nationalistic terms, i.e., as protecting local interests against 'foreign invasion' rather than as involving access to the resources.*

Shift to new technologies

The shift from indigenous technologies to more sophisticated ones marginalized some local artisanal groups that depended entirely on fisheries for their livelihood. But motorisation was a revolutionary phenomenon, it had an all-round impact on the sector. For fishers, switching to motorised boats was akin to the switch from a bullock cart to a motor car in road transportation.

Motorised boats could go farther out and fish longer than traditional boats. Their carrying capacity was higher. Using more efficient fishing gears, they could selectively target important species, reducing fishing time and maximizing earnings. The rapid and manifold increase in fish catches both at individual and national levels bear out the efficiency of modernisation technologies. Further, superior technology enhanced the 'comfort factor' of fishers and drastically reduced the drudgery of non-motorised fishing. The comfort factor was a sufficient incentive for a majority of fishers to switch to motorised boats[21].

The shift to new technologies was accompanied by several adaptations by fishers. How the fishers came to grips with new technologies and made them their own, is fascinating. The process remains largely un-documented.

There were six kinds of adoption of new technologies.

Acceptance and adoption of a new technology in toto

There are relatively few examples of technologies being used in the same form as they had been received by the fishers. An early example of this kind is trawl boats: there were five designs of new boats promoted in Andhra Pradesh (Vivekanandan et al 1997), and these were largely used in their original designs, although the fishers would eventually develop their own designs: the hugely successful Sona boats in Andhra Pradesh and Tangal boats in Tamil Nadu. On the west coast, Out Board Motors (OBMs) were used in their original form. The transition from plank canoes to plywood canoes and FRP boats was marked by relatively few changes to the new systems.

Where the technology was obtained as a package – for e.g., FRP beach landing boats, provided along with engines – in a government programme, the fishers tended to use them as given, because making changes to them would invite costs that they were unwilling to incur. However, when they got a boat of the same design built with their own resources, they would make many changes to it[22].

Where the tools of trade came with a fixed design and could not be changed without some permanent damage to the structure – like the moulded HDPE insulated iceboxes – these were used as provided. The engine was another thing that was generally used as obtained – although even here, fishers seldom used the same horse power as the boat makers advised; and in at least one instance, they did meddle with the engines too, and in a highly original fashion, as discussed in a following section.

Modify new technologies to suit local context

Almost every new technology had to undergo some sort of 'indigenisation' before it could be used by fishers. One might say that the restlessness inherent in the fishing activity rubbed off on the fishers' attitude to life and to new technologies. Even where fishers used tools and technologies the "right way", the way these were meant to be used, this was only so long as the tools functioned. Once a tool needed replacement or repair, the fishers would come up with a original idea to make it work rather than repair or replace it. This was partly because the cost of repair/replacement was frequently exorbitant (which in turn was because fishers never acknowledged a problem until it got big) and partly because the required facilities or expertise were not locally available. But one must acknowledge the ingenuity of the fishers.

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[21] *It is for this reason that the fishers tend to be extremely ambivalent to the suggestion that they should perhaps get rid of the engines and shift to the earlier, manual, mode of operations to cut costs. "Would you get rid of the electric fan and switch to the hand fan if you thought the cost of electricity was a burden?" retorted one plainly exasperated fisherman from Visakhapatnam, who had apparently heard the suggestion a few times already.*

[22] *Often, as shown by some recent studies that explored the extent of quality awareness amongst the fishers, without fully understanding the implications of what they were doing.*

Some examples of new technologies being modified to suit the local context:

- The conversion of the original design of the Pablo boats introduced in 1962 from gill-netters to trawlers by installing winches, making alterations to the superstructure and increasing engine power;
- As mentioned above, the development in the private sector of '*sona*' boats in Andhra Pradesh and the '*tangal*' boats in Tamil Nadu to enable fishers to undertake long duration voyage fishing;
- Improvising the FRP beachlanding crafts developed by the Bay of Bengal Programme by getting rid of the three most important 'innovations' it had: deck, liftable propulsion systems and compact size!
- Dispensing with the gearbox in motorised boats and connecting the crankshaft directly to the engine;
- Developing a long-tail propulsion system for motorisation of wooden catamarans. This was done to motorise traditional catamarans without needing to change their shape or size;
- Insulated iceboxes made of wood or galvanised iron, in place of FRP or HDPE as advised by the promoters. This helped to localise manufacture, reduced costs and suited the need.

Upgrading existing indigenous technology to take advantage of new opportunities/ideas

While adopting the new technology to suit the local context, fishers also made adaptations to existing technologies to ensure a proper fit with the new technology. Examples of this kind :

1. Changing over to synthetic material (from cotton) for fabricating indigenous fishing gears;
2. Changes to the design and construction of plank-built boats. On the west coast, this involved cutting apart the full-plank canoes to fit the OBMs. On the east coast, the changes to local wooden boat in Andhra Pradesh involved modifying the stern, incorporating additional skegs to support the propeller shaft, providing proper engine bearers inside the boat and strengthening the structure of the boat with better engineering to help it withstand vibrations caused by the engines.
3. The *thanguvala*, a traditional net of Kerala, was modified into a ringseine, which became a popular fishing net on the west coast and, increasingly, on the east coast.
4. When the fishers of Anjengo, Kerala, imported the idea of light fishing from the Gulf, they set fire to discarded tyres and used them as torches; then they shifted to Petromax lamps, which gave way to gas lights in due course.

Inventing new technologies based upon new concepts

5. The FRP catamaran was an innovation entirely devised and implemented by fishers. They used the FRP concept they learned from BOBP's beachlanding crafts and built a new boat with the size, shape, and dimensions of their wooden catamarans, simply by using a mould from an existing catamaran. This was first tried out in Puri. The innovation travelled south and became one of the most widely used fishing crafts in Andhra Pradesh and Orissa.
6. The indigenous development of a 'hopper system' to cool the engine without recourse to an additional pump was developed by fishers of Andhra Pradesh. The cooling pump they obtained along with the engines was problem-prone and expensive to maintain, so they dispensed with it and devised this simple mechanism by which the seawater could be drawn into the system in the wake of the propeller action and cool it efficiently with low cost and no maintenance.

Case study: Half-cut truck engines for fishing craft motorisation

A good example of the innovative spirit of fishers is the use of half-cut truck engines for motorisation of the plank-built *Nava* of Andhra Pradesh in the mid-1980s, when motorisation had just been introduced in fisheries. The largest *Navas* in operation were 38' OAL, and carried large quantities of fishing gear, hence needed a much bigger engine than the 10 HP engine available at the time. The fishers managed to cut a discarded 6-cylinder truck engine in half with the help of local mechanics. This gave them a 3-cylinder engine with 30-35 HP, sufficient for motorising the large *Navas*. It was so effective that some 50-60 *Navas* would be motorised by similar means by 1990. It was only when an appropriate engine of the required horsepower became commercially available that the fishers chose to dispense with the half-cut engines.

Using indigenous technologies to improve the performance of the new systems

7. Even after the boats were motorised, fishers on the east coast of India did not forget their sailing tradition: motorised boats continued to take sails with them and used them instead of, or in conjunction with, the engines, thus optimising the operations.

New indigenous technologies to take advantage of new opportunities

Katla teppa: This boat was the fishers' ingenious and indigenous response to the dwindling supplies of wood for boatbuilding and the expensive FRP alternatives for replacing the artisanal boats. It drew upon the design and construction pattern of at least four existing boats and, in cost terms, was quite within the reach of the poorer fishers, which was the reason for its development in the first place.

Meeting investment needs

i. Government

In the pre-modernisation phase, the role of the government in fisheries was quite limited – in fact, for many fishers, its role was limited to providing salt for processing in its curing yards. This role changed in the modernisation period – government policies to meet fishers' need for new investments brought them close to the fishers[23]. In fact, fishers believed that the mandate of the fisheries administration was to support them.

The fact that most 'loans' fishers obtained from the government sources – including banks, cooperatives, and specially created credit supply corporations – were seldom recovered also made fishers strongly believe that the government itself was an open-access resource! This might help explain the credit repayment record of fishers. It may also explain at least partly why, though a majority of fishers are perpetually in debt and private moneylenders flourish, the credit record of fishers with the formal and supposedly more benign credit systems remains abysmally poor.

ii. Private sector

Apart from the government, the other important new entrants into the sector were the private sector entrepreneurs: fish merchants and financiers. As Kurien (2005:76) notes, the traders did not collect interest for use of their inputs; they found the control of fish more profitable. It suited fishers just as well: like the housewives from agrarian communities who paid the fish wives with rice, the fishers too found it easier to repay their loans in kind. Also, even if the trader-intermediaries took a sizeable proportion of the consumer pie, the returns to the fishers were still sizeable. Ready access to the support the traders provided on favourable terms spurred many fishers into a frenzy of investment in improving harvesting efficiency. The investment boom continued so long as the increased investments in technology generated increased returns.

Access to credit had another important implication: fishers could confidently overcome lean periods without necessarily resorting to seasonal migration. For financiers, this was an opportunity to ensure

[23] *When the process of modernisation began, government investments would keep it going till the private sector was confident enough to venture into fishing. Even later, the government would find it necessary to keep investing in the sector through various kinds of direct or indirect subsidies in order to keep the economy afloat.*

access to supplies, while for fishers this became an important livelihood strategy to overcome the effects of lean periods.

iii. Sharing investment costs

Apart from depending on external sources of capital, fishers in some regions developed some new mechanisms to obtain new technologies. Bharathi (1999:66-67) mentions the system of '*kuttut tolil*' (which may be roughly translated as "co-ownership of trawler fishing.") as being a common phenomenon amongst the *Pattinavar*s of Pondicherry and Karaikal regions. What was this system? Two or three households joined to own a trawler – there was even a case of one trawler being owned by seven persons.

Co-ownership was also an important mechanism in ring-seine operations on the west coast, and increasingly on the east coast. It involved some 10-20 households coming together to jointly own and operate a ringseine boat. In practical terms, co-ownership was not very conducive for a capitalistic mode of production. Its success depended mainly on the owners' need to share investments, and later, risks.

New systems of organising fishing

Sharing systems

Ownership of fishing equipment was an important asset in the modernisation phase. In the earlier phase, it's human skills and expertise that were supposed to determine fishing efficiency. Asset ownership got confined to individuals, as opposed to joint/family ownership, to facilitate investments, operations, and trade linkages.

These developments showed up in the way sharing patterns changed from the earlier phase, when a boat used to receive a share equal to that of a crew member; in the modernisation phase, the boat's share went up to one-half of the net earnings, while a crew member's share was reduced to one-quarter or one-fifth (or even less depending on the number of crew members onboard) of the remaining half[24].

An even more important change took place in the mechanised sector, signifying the shift to a capitalistic mode of production: here, the concept of sharing the returns was dispensed with in favour of fixed wages. The distance between the owners and the crew further widened when a majority of the boat owners – many of them from non-fishing communities – chose to remain on shore, as land-based managers of the enterprises.

The new boat owners chose to dispense with traditional kinship ties for recruiting workers. They hired crew from the increasingly large pool of asset- less labourers to get a bigger slice of the earnings pie. The boat-owners saw this as necessary to compensate for their risks, maintain their assets and service outstanding debts. Large families would still be an asset, but only at the workers' level – because it helped to maximise wage earnings. Many boat-owner families shifted to small nuclear families because larger families meant dissipation of capital.

Shift to shrimp

Since shrimp was the most important and priciest item in the market, fishers chose to focus their attention on shrimp capture.. The mechanised sector had an explicit shrimp focus right from the beginning; but even motorised and non-motorised boats increasingly targeted shrimp. The arrival of trammel nets in the 1980s allowed many artisanal operations to become shrimp-centred, with shrimp accounting for between 40 and 70 percent of the annual income in many fisheries across the east and west coasts[25], as a research project in 2001 indicated.

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[24] *The reduced share did not reflect the real income that a crew member earned, which would still be higher than what he would have earned in the pre-modernisation period. This – together with the 'comfort factor' – accounts for the unwillingness of crew members to return to traditional non-motorised fishing.*

[25] *In Kerala, the demand for sardines and mackerels in local markets as well as the availability of alternative candidates like cuttlefish and squid for exports, meant that the fishers diversified their operations to include a range of other species. But on the east coast, the opportunities for diversification were not many. The fishers did use a range of nets seasonally, but shrimp accounted for a large proportion of their income.*

The emphasis on shrimp led to sizeable increases in incomes, and, as many fishers assert, reduced their working time. Moreover, they could attract big advances on favourable terms from the trader-exporters who also supplied a range of other necessities: ice, containers, spare parts, even fuel.

Remote villages were integrated into shrimp supply chains, leading to improvements in transport and communication facilities. This emphasis on shrimp, and later on high-value fish for the urban trade, helped fishers to use species-specific fishing gears, and reduce the use of traditional all-purpose fishing gears like shore-seines or boat-seines, which were cumbersome to operate, required large numbers of people and paid little.

Survival of traditional market chains

While the economic status of households improved because of the shift to export/distant markets, the loss in terms of social space for women was significant. The change in gender roles was also reflected in changes at the household level. Earlier, both men and women in the productive age group earned money; now the household incomes were dominated by men. Traditional activities that older people engaged in became redundant in the face of changes brought about by modernization; they were relegated to the backstage.

On the other hand, to the extent that the new supply chains focused only upon shrimp and later on some high-value fish catches (seerfish, pomfret, sea perch, *hilsa*), local fish traders had little to complain about – except that the fishers were not targeting the cheaper fish as much as they did before. They continued to have their own small niches at the landing centres and had a monopoly over specific varieties of fish. They also took good advantage of the new opportunities that modernisation offered them – larger quantities of fish, improved post-harvest facilities, access to new markets. They travelled farther out, covering up to 40-50 kilometres mainly to the nearby urban centres, and took recourse to ice for keeping their fish fresh. The economic performance of the fish traders improved because of such adaptations.

Case study: Porkili, fish vendor, Anichankuppam, Villupuram district

Porkili used to carry her fish to Kiliannur, a big town with many slums, which meant big demand for low-cost fish. She had regular customers there. When local fish catches in her village got better, some large-sized fish were part of the catch, and access to ice improved, she shifted her trade to Tindivanam, which was a major commercial town with a sizeable floating population. This was also necessary because increased landings drew more fish traders to Kiliannur, and competition forced a shift to a bigger market. A number of offices and business establishments were located in Tindivanam; Porkili's clientele changed from slum-dwellers to white-collar people. Traders from the neighbouring villages visited Tindivanam regularly and bought cheaper fish for sale back home. Porkili began trading in a combination of fish consisting of cheap varieties as well as more expensive ones to cater to different customers. This increased her investment needs, also her returns.

That the opportunities for petty trade were quite good until the early 1990s was evident from the huge increase in the numbers of bicycle fish vendors during this period in almost all coastal areas of Andhra Pradesh, Tamil Nadu, and Kerala[26]. The bicycle fish vendors competed with the local women, but catches were sufficient for everyone's needs. While the women, being ***inside*** the system, obtained some privileges (such as preferential access to fish, credit), the bicycle vendors paid ready cash – a point in ***their*** favour. So the balance was pretty even.

More fish! This gave dried fish producers and traders an opportunity. During certain months, boats and shore-seines could catch only large quantities of small pelagics. These had to be converted to dried fish, because their low value made it uneconomical to transport them over long distances (for instance, to Kerala). With more fish available for processing, and distant markets for dried fish across the country (such as the northeast) becoming more accessible, markets and trade flourished as never before. Underhand trade with Bangladesh developed too.

[26] *This was partly due to the signs of fatigue that the mammoth Green Revolution was developing in agriculture, pushing people to seek alternatives – a process that the Blue Revolution (as the modernisation process would come to be called) would repeat in fisheries in 1990s.*

As demand for fresh fish outstripped supply in major fish-consuming states like Kerala (which faced serious declines in the catch of sardines and mackerels), they attracted dried fish from the rest of the country. Gujarat, where the fisheries sector developed on commercial lines right from the beginning, emerged as a major supplier of dried fish to the rest of the country, but Andhra Pradesh and Orissa were important suppliers as well.

Unlike fresh fish, which could be transported by train, the dried fish trade depended largely on trucks for long-distance transport. This growth in inter-state trade for dried fish gave rise to large-scale dried fish production centres in many major fishing centres on the east coast. Kerala traders played a role in setting them up; but day-to-day management of these centres, if not actual ownership, was done largely by local people, mainly women. They employed local women as wage labourers. This was in contrast to the earlier phase when fish processing was a cottage industry, reciprocity was the norm and helpers received a fistful of fish for their services[27]. Another important indicator of the success of processing activity during this phase was the rapid increase in a new market supply chain for fish meal — which found use in the poultry sector and, later, in aquaculture.

Social organisation

Traditional governance systems – or rather, their role in conflict resolution at sea – had been usurped by the government. Now their status on shore too changed. Motorisation and mechanisation led to the emergence of elites in the villages. The newly rich families increasingly looked outwards for social acceptability. Within the communities, these families gained additional status from their proximity to the government. They were helped by the enhanced status of shrimp as a money-spinner in the outside world, which suddenly woke up to the economic potential of the sector.

The new boat-owning classes had little time for traditional governance systems (even if they were controlling them) and its emphasis on social security over profit maximisation. In a context where the guiding principles of community governance ran against the law of the land, people could – and did – take recourse to the law whenever the community ruled against their interests. This led to the entry of the police and the courts into the villages, which usurped the law and order function of local systems.

All this clearly pointed to the need for a revaluation of the role of the traditional governance systems. The most dramatic illustration of this shift occurred in the *Vadabalija* migrant communities of Andhra Pradesh origin, who settled in Puri. In Puri, as Schömbucher (1985) noted, caste and kinship ties no longer constituted the unit of social and political organisation; instead, it drew on the economic organisation of the fish trade and evolved around the '*barapa*' (fish storage warehouse) and its owner.

Even in more conservative and sedentary fishing communities like *Pattinavar*s in Tamil Nadu, traditional governance systems gradually reoriented their roles and reinvented themselves, taking new forms. This applies equally to the Church parishes of southern Tamil Nadu and Kerala, the ***karayogams*** (traditional governance systems in Hindu fishing communities) in the central zone of Kerala and the mosque councils in the northern zone of Kerala – all of which played more or less the same roles as the caste panchayats of the east coast and adapted themselves to similar kinds of challenges.

In the debates about traditional panchayats, they come across as rigid and hide-bound little dictatorships, because they are caste-dominated and male-dominated. This perception ignores the flexibility of these governance systems. Otherwise they could never have interpreted communal laws in such a way that it maximised benefits to their constituency while avoiding strife within and outside the community.

Today, panchayats continue to be relevant because fishers in these largely inward- looking communities need panchayat leaders to play the crucial role of go-between with the wider world, especially in dealings with the government. Unlike agrarian communities, which perforce had to deal with the bureaucracy and knew the importance of paperwork (title deeds and registration documents being essential for access to

[27] *It was also a social activity, offering an opportunity for women to come together and spend long hours working and chatting. The eternal net-mending that the men seemed to indulge in whenever they were on the shore was also a mechanism to socialise, and it is equally applicable to the only other activity they were interested in on the shore: drinking.*

lands), fishers worked in a less formalised system where oral agreements were the norm[28]. Now in the face of radical transformation of the sector itself, the communities' dealings with the wider world have increased manifold, but they are clearly unprepared for it. With government now being an important stakeholder at the community level – it provides support, arbitrates in disputes both at sea and land – people have to deal with its structures and systems more frequently than they would have liked.

Thus, the role of the panchayat changed — from being the key decision-maker in the village to being an intermediary in fishers' dealings with the outer world, including the government. There were also other changes within the systems: one important example being that panchayat members were elected at regular intervals Earlier, memberships were hereditary positions held by dominant clans in the villages.

Many of these changes had a lot to do with sheer opportunism: the leaders could see which way the wind was blowing. They knew that they themselves would become redundant if they did not change with the times. It is also true that individual leaders made the transition for personal gain; they gained both materially and politically from the change and used their newfound proximity to power centres for fostering new relationships of patronage in the villages.

C. Livelihood enhancement strategies in the post-modernisation phase

If the modernisation phase imparted some strengths to fisheries, it also gave it some weaknesses. These would become apparent in the post-modernisation period. Thus, if the modernisation phase was a period of opportunity, the post-modernisation period was one of coping with adversity. The livelihood enhancement strategies reflected this[29] fact.

The field studies listed 10 broad categories of livelihood enhancement strategies in the post-modernisation phase[30]. These will be discussed in the rest of this chapter, using some examples obtained from field work in selected locations of Tamil Nadu, Kerala, and Andhra Pradesh. Some of these strategies are contradictory, because different stakeholders in supply chains work at cross-purposes, also because the livelihoods differ in different locations for the same category of stakeholders.

Further, the same category of people in the same location could opt for two contradictory strategies. For instance, some mechanised boat owners in Nagapattinam are willing to shift to a cheaper mode of fishing or move out altogether, while another group actually invests in steel boats that cost twice as much as an ordinary trawler. Ironically, in both cases, the mounting cost of operations is cited as a reason for their choice!

Diversification of supplies, supply sources and markets

Diversification of supplies (i.e., in terms of species obtained), supply sources, and markets has been the most important livelihood enhancement mechanism in every fishing community and in every activity in the sector. While this offers new opportunities to maximise incomes, it is mainly a risk-reduction mechanism for several categories of people.

Diversification in fishing operations

Diversification of fishing effort is the norm in different parts of Tamil Nadu and Kerala. It takes the form of: simultaneous use of different fishing gears (for e.g. hook-and-lines along with trawl and gill-nets), using different varieties of the same gear at different times (for e.g., trawl nets with different mesh sizes); and use of different mesh sizes within the same net. People who have access to more than one option tend to use them. Thus, the fishers of Pillumedu, who have received FRP boats under post-tsunami programmes, continue to fish with their wives on the *kanna thoni*s in the Killai estuary because, even though the *kanna thoni* fishing was hardly a paying proposition, and demanded tough manual labour, it at least offered a stable secondary income (while they cannot take the income from FRP boats for granted).

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[28] *As example one could cite is the organisation of credit in fishing villages: Credit supply used to be informal, as loans were given out based on nothing more than mutual trust. Similarly, the arguments that raged after the tsunami about the legitimacy of fishers' ownership (or lack of it) of their housing sites also highlight the fishers' new emphasis on asserting their ownership.*

[29] *Some of the choices presented here may not necessarily have their origins in the post-modernisation phase. But to the extent that these strategies are still valid in terms of addressing the livelihood concerns of fishers, they are considered relevant for inclusion here.*

[30] *We must acknowledge that the typology is just one way of consolidating our knowledge about LED: it is accepted that it is neither exhaustive nor static.*

Diversification of fishing grounds takes place both vertically and horizontally from the shore. While most motorised fishing operations in Andhra Pradesh were confined to within 30 fathoms until the late 1990s, nowadays they fish almost entirely in waters beyond 30 fathoms. In Tamil Nadu and Kerala, there is no doubt that many fishing operations take place in offshore waters – where it is supposed that no fishing effort is currently taking place. The shift in fishing grounds also takes place horizontally – i.e. along the coastline – in many mechanised and motorised operations, a cause of conflicts as the boats keep encroaching upon the fishing grounds of other communities.

A good example is also the case of shark fishers from south-west coast, who roam the entire length of the west coast in search of sharks. But the location of their quarry in offshore waters means that their operations do not trigger conflicts with local communities. In the trawl sector in Kerala, while the smaller boats confine their operations to near-shore waters, targeting shrimp, the bigger boats go into much deeper waters and target a variety of fish, including cuttlefish, squid, and some fish species, and even undertake hook-and-line fishing targeting tuna.

Diversification in terms of target species in fishing is best illustrated in the shift from shrimp to other species. Many motorised and non-motorised operations in Andhra Pradesh now focus less on shrimp and more on other varieties – especially those with a demand in the urban/inter-state markets. Shrimp still gets to be targeted – after all, it is still the most expensive species many of them can catch – but the failure of a shrimp season is unlikely to create as much hardship as it did in the past.

In Tamil Nadu, the spread of ringseines indicates that the focus of fishing shifted to sardines and mackerels (which were considered until recently as fodder for dried fish trade), and shrimp takes a second place in these systems. More dramatic is the case of mechanised boats in Mudasalodai, which turned to ringseine operations (requiring substantial changes to the superstructure), and whose owners, when asked to name the important fish catches from an economic point of view, completely forgot to mention shrimp until they were reminded!

In Kerala, additional investments were made to convert mechanised fishing vessels to target a wider range of fish, specifically cuttlefish, in order to shift attention from shrimp. A similar shift is taking place in shark fishing operations of the west coast, where shark constitutes less than half the total catches, while other species like tuna, carangids, groupers, cuttlefish and other fish constitute the rest.

With the decline in marine supplies of shrimp, exporters shifted their attention to aquaculture for sourcing their supplies. Aquaculture now accounts for nearly 80 percent of the shrimp exported from India. This doesn't mean that shrimp is no longer important in marine fisheries; the shrimp fixation of mechanised fishing and brackishwater aquaculture might go on for a long time, and many small-scale activities too depend on shrimp for a large proportion of their earnings. But their dependence on shrimp is declining. Most fishers tend to view it as the 'icing on the cake' while focusing on new domestic supply chains to earn a substantial proportion of their incomes.

Diversification from export to domestic urban/inter-state trade

The diversification from shrimp to other species is influenced by the changing market context: the shift is accompanied by a change in supply focus from exports to domestic urban trade. While the growth of the export supply chains owes largely to the initiatives of the government (which had set up a Marine Products Export Development Authority in the early 1970s), the growth of domestic urban supply chains owes largely to the enterprising nature of players in production and supply chains.

The coming of improved post-harvest tools and infrastructure facilities to coastal areas boosted urban trade. Building upon the access to infrastructure, preservation, transport, and market linkages that the shrimp export chains had made available, traders tried catering to the demand for certain varieties of fish in urban markets in the mid-1980s. Places like Kanyakumari and Nagapattinam were apparently pioneers in this process. Their proximity to Kerala markets also helped.

As the urban trade spread to northern parts of the east coast, it was often the traders from Tamil Nadu and Kerala who initiated it in major supply centres like Kakinada, Visakhapatnam, Puri and Paradeep, established necessary linkages, streamlined production and transport systems and helped the local traders

to get involved in the process. The proliferation of ringseines and the focus on small pelagics on the east coast was an outcome of big demand from Kerala.

Result: by the early 1990s, fish from a number of locations all along the coastal areas were reaching distant urban centres, travelling across the states by train, later by trucks and later still, by insulated vehicles. Specific urban markets were primed for different species, so that from Puri, on any given day, catches of seerfish would be sent to Chennai, *hilsa* to Kolkata, pomfrets to Mumbai, shark to Alwaye in Kerala, and sea perch to Delhi.

An important aspect of the growth of the urban supply chain is that it was largely, if not entirely, driven by the artisanal sector. The shrimp-driven economies of the mechanised sector (except where they switched to purse seining) would not allow traders the freedom to target anything but shrimp (and, in some cases, cuttlefish, and squid). Similarly, when the ribbonfish exports to China began in 1990s, the existing urban trade network was more instrumental in the process than the export supply chain, which was too shrimp-centred to cater to demand for other species at that time.

In the early stages, fish were packed along with ice in bamboo or palm-leaf baskets, the packaging material was then changed to plastic crates, and later still, to insulated (Styrofoam) containers. The fish needed to be carried from landing centres to a centralised location, where they were packed in ice, transported to the railway station for loading into a train. The whole process took anything between four and eight hours (depending on when the train left the station), while the journey to the final destination would take another 30 hours or more. This meant that the rate of spoilage was high – the buyers routinely discounted 30 percent of the catch as being spoiled and paid only for the rest.

Over time, this practice gave way to packing fish along with ice into the containers on the beach and loading them into insulated vehicles waiting by the side, which took off immediately for the final destination – the whole process now took less than two hours and the journey came down to 20 hours, with no spoilage-related losses.

While the urban market supply chain might have become possible due to the export market linkage, it was also radically different from the export chain and needed a whole new trade 'grammar' to be developed and refined. It required new kinds of infrastructure, new systems of procurement, processing, packaging and transport, new communications systems, new trade linkages, new systems of advances and repayments, and a whole new set of trade intermediaries. The initiatives of the fishers and their trader counterparts in making this happen remains one of the very few *true* success stories in the fisheries sector in the last fifty years. Its growth over the 1980s and 1990s was such that it surpassed the shrimp supply chain as the important income earner in many areas on the east coast of India.

The importance of this new supply chain lies in the fact that it managed to provide a sustainable, local, alternative to the risky, single-species oriented, export trade. The viability of many fishing systems depends upon this trade and it can be considered as the most outstanding livelihood enhancement strategy by the fishers.

Diversification by petty fish traders

In all the sites visited during the field work (Coromandel Coast, Kanyakumari, Kerala, Andhra Pradesh), petty traders were seen to have diversified their sources of supply, earlier largely confined to the local landing centres, to include a range of other sources. The women travel long distances in groups to several fish landing centres in the area. The nearest fishing harbours – which act as trawl bases – are their most important source of supplies. Consequently, fishing harbours at Pondicherry, Mudasalodai, Parangipettai, Pazhayar, and Nagapattinam receive large numbers of petty fish traders every day from neighbouring areas.

Occasionally, the traders would also source their supplies from fish markets or from trucks carrying fish from the Coromandel Coast to Kerala, in order to ensure regular supplies to their own clients. A good example of the extent to which women traders would go to meet their need for fish comes from the west coast.

Women traders from as far south as Trivandrum travel in groups to Mangalore during the lean fishing period in Kerala, obtain fresh fish from the landings of mechanised boats from Mangalore and Malpe, and bring them back in iced condition for local sale. These women also buy dried fish in bulk, carry it back home and sell it, thus earning a decent daily income to survive the lean period.

With the increase in ringseines along the Coromandel Coast, women traders are buying fish in small groups (of about 10 women each). The catch thus bought is shared equally among the group. Each woman will then take her share for sale on her own. When going to other villages for procuring fish, they go in groups of five to 10 people, increasing their capacity to buy fish. The women share an auto-rickshaw to visit neighbouring villages, buy fish as a single group, share them and take them to markets individually. Selling fish as a group does not sound an attractive proposition as each woman has her own customers and also prides herself on her ability to get the best prices. But group selling may well be the logical next step in a series of coping strategies the women have been adopting.

This diversification is not confined to sourcing supplies alone; increasing competition would mean that women traders too have been quite active in diversifying their places of operation as well as their customer base. Women traders in several areas cater to two different categories of customers: one offers a higher profit, the other ensures stable earnings.

Case study: Women fish traders, Parangipettai, Cuddalore district

Every day, women fish traders take their fish to Chidambaram for door-to-door sale, focusing on particular customers. Changes in supply and demand at landing centres meant that mackerel – the fish that the women preferred to buy because it was cheap and affordable to customers – became rather difficult to get; more expensive fish like seerfish and wolf-herring were more easily available (though by no means affordable), because their catches were too insignificant in volume for transport over long distances. Knowing that their customers could not afford to buy expensive species, but needing to diversify, the women started buying a mix of high-value and low value fish. The growing middle-class demand for fish in Chidambaram gave traders an opportunity to sell them seerfish (which offers higher margins of trade). Poorer customers continued to buy the cheaper fish (ensuring stability of operations).

In many other cases, the process was reversed: With growing demand, more and more fish joined the distant market chains, creating a vacuum in local supply. Cheaper fish would be fed into local supply chains. This required adaptations from local traders and local consumers. It may have also led to better utilisation of different low-value species.

The outcome of such changes was that the women traders find themselves shifting to other varieties of fish and new customers, to survive in their businesses. A similar change also occurred in urban markets, where traders diversified their focus from some expensive species – seerfish, pomfrets, sea perch, sail and swordfish, snappers – to intermediate varieties (catfish, mullets, mackerels, tuna). Their customer orientation, once predominantly upper-class and middle-class, now included working classes as well.

As a result of dwindling supplies of fresh fish, some fresh fish traders switched to the dried fish trade, using the cheapest varieties of fish obtained from trawl bycatch for making fishmeal. Fresh fish sellers at Kakinada fishing harbour thus switched entirely to making dried fish for poultry. It was more stable than the fresh fish trade, and remained in business for a few years, when the arrival of ringseines and other developments in the sector once again improved their access to fresh fish. They then reverted to trading in fresh fish.

Optimising operations

This is about strategies adopted by fishers to counter the rising cost of operations and reduce the need for investments. One of these strategies seems to be a return to pre-modernisation arrangements and technologies. Examples in this category:

Back-to-basics

There is evidence that mechanised boats owners have been shifting to FRP boats. In places like Mudasalodai (Tamil Nadu), FRP boats are considered to be less risky economically than mechanised boats. In Marianad (Kerala), wooden catamarans are re-emerging, and increasingly taking over from FRP boats as the main fishing crafts. The switch of many mechanised boat owners to FRP also triggered problems between owners and crew in places like Pazhayar in Nagapattinam district.

In Andhra Pradesh, a switch from motorised to non-motorised wooden boats, including some 'improvised' traditional designs like '*katla teppa*', is a noticeable trend. Several mechanised and motorised boat owners also choose to sell their boats, preferring instead to work as crew on others' boats. This means less money but less risk as well[31]. Several motorised boat owners in Andhra Pradesh and Orissa either sold or abandoned their boats and started to work as crew on others' boats.

Reducing costs

Fishers undertake fewer fishing trips in order to reduce risk: to the extent possible, owners avoid sending their boats for fishing unless they are sure of covering their costs[32]. The mechanised fishing boats of Andhra Pradesh switched from fishing voyages of long duration – which went up to 14 days in the early 1990s – to shorter fishing trips (4-5 days). They increasingly prefer one-day operations, which keep costs low and prevent losses. Curiously, Kerala/west coast fishers addressed the same concern in the opposite way: they increased fishing duration and undertook long-term voyages in both mechanised and artisanal operations.

Fishers increasingly use engines of lower horse-power to reduce fuel costs. At one time, west coast fishers preferred engines of higher horse-power. They said they had to travel long distances and land their catches at specific times to get the best returns. Some of the boats even used two outboard motors to get the required speed. But this preference is changing. In Marianad, for instance, many FRP boats use 9.9 HP engines; at one time they used engines of up to 40 HP. There is also optimisation through smaller operations. In Kerala, the larger ringseines operated by 60-70 people using an inboard engine (IBE) with very high horsepower, are giving way to smaller/shorter ringseines, operated by 10 people using a 25 HP out-board motor (OBM). The savings in terms of crew wages and fuel economy are considered more important than the possibility of higher catches[33].

There is also a switch to cheaper fuels. The mechanised boats of Andhra Pradesh, which used diesel-operated engines, have shifted to using kerosene for fuel while retaining the same engine. This means a major overhaul of the engine every six months, and that's expensive; but the fishers have worked out the economics and found that kerosene in place of diesel is more sensible. There is a fear that use of kerosene may shorten engine life, but fishers are more concerned about saving now than worrying about tomorrow (another case of 'living for the day').

Another example of alternative fuel use comes from many places in Kerala – Anjengo, Vizhinjam and Aratupuzha. Boats here have switched to LPG for fuel. The conversion from kerosene to LPG is estimated to save up to 50 percent of the fuel costs.

In Andhra Pradesh, the use of sails plus engines has increased in motorised boats. In fact, several boats have dispensed altogether with engines; sails/manual propulsion methods are back in business. This allows people to work at virtually no cost, justifying the confidence of fishers about their ability to make a living out of fishing at any level. This reversal to non-motorised operations also brings back another pre-modernisation practice relating to sharing systems. The practice of crew members receiving an equal share with the boat is back.

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[31] *In fact, in some prioritisation exercises in Andhra Pradesh and Orissa, the boat owners were ranked as being poorer than the crew they employed, because of the risk inherent in their profession.*

[32] *A similar strategy appears to apply in case of petty fish traders. They would rather avoid buying fish altogether than risk making a high investment that might not pay off.*

[33] *Some of the larger ringseines discarded in Kerala are being bought by fishers on the Coromandel Coast. They use the ringseines for joint ventures involving as many as 10 FRP boats for each net. They are thus putting to use the surplus boats provided under different tsunami support programmes.*

Increasingly, some fishers are moving away from operations with specialised fishing gears (that target specific high-value varieties like shrimp or seerfish) to operations with more general fishing gears like gillnets and bag-nets. These catch a mixture of species and at least ensure a certain minimum income. With uncertainties in the availability of fish, the number of fishing nets onboard – and hooks, where they are used – increases, so that fishers could make use of any net at short notice. FRP boats have become very versatile in operational orientation — gillnets, trammel nets, boat-seines, ringseines, hook-and-lines, long-lines, and traditional/mini-trawl nets. They thus manage to be active round the year.

An interesting adaptation to reduce costs: shift the nets from FRP boats to non-motorised catamarans for a part of the year, when the fish are available in near-shore waters (or when their availability is uncertain). This lowers running costs. When catches seem assured, the nets are moved back to the FRP boats. There are also instances of seasonal shifts from FRP-boat fishing to mechanised fishing, and from FRP fishing to catamaran fishing on the south-west coast. During the ban period on trawling, for instance, the crew go fishing on other units in Kerala.

Fishers choose to land their catches at centralised locations, where they can be assured access to essential services: ready market, fuel, ice, spare-parts. Some of these services are more expensive in their villages, often not even available there. This means a loss of opportunities for local traders, who must travel to large fish landing centres for assured supply of fish. Some dried fish processors in Andhra Pradesh have abandoned processing activity altogether. Instead, they procure finished products from major fish processing centres (such as fishing harbours). This considerably reduces their risks.

Changing sharing patterns

There are changes in sharing patterns. Many motorised boat owners – who had become land-based managers of fishing in the initial stages – have moved into fishing themselves, to get an extra share. The pre-modernisation custom of employing one's kin in fishing is coming back into vogue. In many shark fishing boats in Thoothoor region in Kanyakumari district, younger boys in the family are employed onboard as cooks and helpers. The experience of going out to sea and working enables them to eventually become fishers themselves. Likewise, when fishers migrate from the east coast to Gujarat, younger people are employed as cooks and helpers — a period of apprenticeship.

In the mechanised sector in Andhra Pradesh, the crew earned money from bycatch, while the owners were satisfied with the returns on shrimp and high-value fish. With shrimp catches becoming uncertain and bycatch value going up, the owners have begun to claim a share in bycatch returns. But a more important change has occurred in terms of payments to the crew. From the beginning, the crew received fixed wages plus some share in the catches. But when the returns from fishing came down, the owners changed the arrangement to one of sharing, thus returning to the pre-modernisation pattern. To improve their share, the crew in Kerala get into hook-and-line operations, where sharing systems are different and tilted in favour of the crew.

With catches becoming erratic and uncertain, the system of 'advances' from traders – a system largely responsible for overcapitalisation of the sector – is weakening. In the Tamil Nadu and Andhra areas visited during the study, many fishing systems had received no advances or very small advances. The advances to fishing crew had come down correspondingly. This fitted in with the changing patterns of sharing which are reverting to a pre-modernisation mode.

Sharing risks

In some places visited during the study, joint fishing operations seem to have become the norm. In joint fishing, a group of boats work together as a unit, share information, carry out joint operations and share the returns. In the Andhra Pradesh mechanised sector, 10 boats work together as a group. Instead of all the 10 going out for fishing on any given day, one boat is sent to scout the fishing grounds; after ascertaining the conditions, the boat radios back to the base to instruct the others whether to proceed or not. This means big savings on fuel and other costs. A slight variant of this practice is reported at Mudasalodai. Boats in a group fan out in different directions and tell one another about the best areas to focus on.

In the artisanal sector too, joint fishing operations are the norm. Interestingly, the arrangement does not necessarily involve two boats fishing together. It depends on their using two varieties of nets in different

fishing grounds. When they come back, the returns from the catches are pooled and shared equally irrespective of the work each boat has done. This is a risk reduction strategy. It doubles the chances of a good catch. It ensures that fishers manage to earn something even when if they could catch nothing. A similar risk reduction strategy is said to operate with ringseines in Kerala.

Take beach-seine fishing in northern Andhra Pradesh. Sharing systems have been expanded to include the largest number of people in the activity, as happened in the pre-modernisation days. Forty to 50 people enjoy ownership of a net; they may or may not take help operate the net themselves. Each of the owners gets a share, those who operated the nets get a share each. If a owner also takes part in net operation, he gets two shares. The *Karanila* system in Kerala operates along similar lines. It helps fishers reduce competition and pressure at fishing grounds, while ensuring that fishers who could not take part in fishing on a given day get a share of the returns.

In the fresh fish trade, group-based procurement and transport of fish seems to be on the rise in all areas covered by the study. In the processed fish trade, both processing and trade are undertaken by two or more processors, reducing risk and workload. Group procurement becomes necessary to compete effectively against large-scale traders and reduce the cost of investment (which will be higher when the fish are bought individually).

Consolidation strategies

The informal nature of operations in fisheries allows entry and exit for large numbers of people, and for a diversity of production and supply arrangements. But it also makes the systems unwieldy, unregulated and incapable of coming to grips with challenges – especially when it comes to improving economic performance.

One optimising strategy envisions consolidation of activities into more cohesive entities to improve the efficiency of the system, cope better with change and reduce risk. The EU-directed ban on imports of Indian seafood in 1997 drove reorganisation within the processing industry. The procurement, processing and export operations got consolidated into fewer hands. This marginalized several small-scale operators, but it also strengthened the capacity of the system to handle future demands on it more confidently. Several small-scale processors also became sub-contractors to larger trading houses. This helped them to tap investments for procurement and processing. They also had assured sales while avoiding the expensive formalities for seafood export.

A similar consolidation is apparent in many villages of the Coromandel Coast, where ringseine catches are sold almost entirely to Kerala buyers, often actively ignoring local demand and local petty fish traders. Reason: Local demand is not big enough to absorb all the landings and also tends to be scattered, whereas the Kerala demand – as far as the producers are concerned – is more focused, consistent, lucrative and able to absorb almost any amount of landings in one transaction.

It is reported that the efforts by local women to form cartels of their own and bid for fish at a higher price in auctions failed. Producers were not really keen to supply to local markets and upset their links to the more consistent trade in Kerala. This does lead to concerns about the impact of Kerala markets on local traders. But it must be borne in mind that if the Kerala demand did not exist, the local fishing economy would have been in far more serious trouble, affecting everyone equally.

At a local level, consolidation occurs in the form of petty fish traders and fish processors working as groups to do their businesses. While the petty fish traders increasingly use group mechanisms to obtain supplies and transport them to markets (but *never* to sell fish, where joint operations are anathema), the processor-traders – generally operating in groups of two or three at most – undertake processing and trade operations jointly, with one woman looking after the procurement of supplies and sale of the product, while the others take care of actual processing and storage operations[34].

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[34] *The main advantage of joint operations in fish processing is risk reduction. As one processor in the coastal village of Chandrabhaga in Orissa once explained: "If I were to invest Rs. 1,000 and lose half of it in the market, I would not be able to undertake another operation: the costs of operation remain largely the same with a small operation as with a large one, and the returns would barely cover them. If we worked together and lost half our investment, it would still leave us with enough to do another cycle."*

Loss-reduction strategies

With access to fish dwindling, an important strategy has been to reduce fish losses to the extent possible and maximise returns.

Many boats carry ice onboard. While some new boat designs come equipped with insulated ice boxes (or fish holds, in case of mechanised boats), others use separate ice boxes, or some kind of improvised contraptions onboard – like the wet gunnysacks by fishers in Hut Bay in Little Andamans – to keep fish from spoiling. Other adaptations to reduce spoilage include reduced fishing time, shorter duration of each fishing haul and (in Kendrapara district in Orissa) use of 'mother boats' to transport fish to the shore at regular intervals.

Ice is everywhere: petty traders use ice to protect their fish on the way to the markets as well as to store it overnight. This has become so established that when ice is not available locally, women on the Coromandel Coast travel long distances to fetch it. This means incurring additional costs; but even then, they find no problem in recuperating the additional investment from the marketplace.[35] The dried fish processors of northern Kerala use ice for storing fish until it can be processed. For the export and domestic urban trade supply chains, ice is a MUST, and used quite extensively to reduce spoilage.

Discards of bycatch at sea – and the consequent loss of fish – were in the news till the mid-1990s. Mechanised boats on the east coast of India discarded sizeable quantities of fish at sea because of insufficient space onboard and insufficient demand on the shore. But the quantity of discards has come down significantly since then, because of fishers' need to maximise their incomes by utilising everything they catch. The growing demand for any variety of fish for human or poultry consumption, and the shortened fishing trips, have reduced the incidence of discards.

Many hook-and-line fishing operations in Trivandrum use two engines to reach the shore faster and sell their catches fresh. Some mechanised boats may have installed improved chilling and storage systems onboard – especially when they have been leased out to Japanese fishing companies operating from Kochi to catch yellowfin tuna.

Protecting turfs at sea

Stakeholders in production or supply chains often assert or reclaim their rights to resources or to markets, or try to preserve their niches within the system. Example: the artisanal fishers' fight for zoning of the sea to ensure them secure access to fishing grounds without competition from the mechanised sector. The subsequent fight against the entry of foreign fishing fleets is another example of turf protection. Other examples obtained during the field studies include:

Protecting turfs at sea

Use and access rights are increasingly being asserted in the open sea, often overruling the 'reciprocity' principle. An example comes from the central zone of Andhra Pradesh coast, where local fishers of Machilipatnam area refuse entry to seasonal migrants from northern villages like Uppada. In retaliation, the fishers of Uppada do not allow boats from Machilipatnam area to operate in waters close to them or even to berth at the neighbouring Kakinada fishing harbour.

Even where reciprocity principles are still respected, there are bans on use of certain fishing gears. The ban on ringseines being used near certain villages as a measure to protect local fishing interests is fairly widespread on the Coromandel Coast (for e.g. Kaipeni Kuppam) and in Andhra Pradesh. Similarly, there are bans in Kerala on the placement of artificial reefs in gillnet operating areas. The employment of migrant workers in local fisheries in Gujarat and North Kerala reveals another form of turf protection: the migrants can work on local boats, but cannot operate their own boats.

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[35] *The aversion of some of their customers to buying chilled fish (most consumers believe that only spoiled fish were iced), appears to remain a problem in many places – in Orissa, on the Coromandel Coast in Tamil Nadu and even in Kerala. This is often overcome by keeping fish out of ice for some time before sale, also by liberally sprinkling sand on the fish to give the impression that it has been brought straight from the beach. In fact, a visit to the fish market in Trivandrum as late as January 2001 revealed an unusual category of sellers. They specialised in selling sea sand, which buyers would sprinkle on their fish prior to taking them for sale! Unfortunately, the unit of sale and the price of the sand were not ascertained.*

On the shore too, there are curbs on boats from one village landing their catches in another village, for fear of depressing prices. This is especially true with ringseine catches on the Coromandel Coast. In Vizhinjam, near Trivandrum, non-local fishermen are not allowed to sell their fish during the normal fishing season for fear that this will upset the prices for local fishers.

During the rough season from June to August, non-local fishers are allowed to sell their catches, but only after local fishers have sold theirs and obtained the best prices. In Annankovil, on the other hand, increase in fish landings due to congregation of boats from a number of villages is regarded as a positive development in the long term; the assurance of fish would draw more traders to the area. In this instance, turf is protected by developing infrastructure to cater to a wide range of fishing systems.

An important traditional measure of turf protection is that of specialisation within fisheries. A specialist group found in many coastal states is the hook-and-line fishing community. The long-liners of Thoothoor in Kanyakumari district are highly skilled in targeting sharks, tuna, and large carangids, and their capacity to operate fearlessly in offshore waters allows them to avoid competition from other villages/fishers. The Marianadu hook-and-line fishermen developed mastery over their operations and used advanced systems like GPS in their operations, making it difficult for other fishers to compete with them.

Some specialist fishers, in Parangipettai, for instance, are credited with special skills and 'secrets' which they don't divulge to anyone but their own descendents. Similarly, making specialist products like '*masmeen*' is supposed to be a skill exclusive to certain groups of people who pass it from generation to generation. While '*masmeen*' is nowadays being made also in other places by other people, Maldivian fishers are by common consent the best. Another specialisation relates to knowledge of the sea and the fishing grounds. Take *mada* fishing in Kerala. Information about good fishing grounds and fish species is the preserve of a few closely-knit groups of fishers or fishing units. A similar system operates in the mechanised fishing units of Andhra Pradesh. They operate on group lines to cut costs and keep under wraps information about potential fishing grounds.

Protecting turfs on the shore

Petty fish traders follow the same strategy as their predecessors: they forge long-term social relations with their clients and with households; sell on credit; and accept payment in kind. In fact, the fish-cum-sweetmeat sellers in several landing centres in Andhra Pradesh survive entirely by the non-monetised nature of their transactions: they exchange sweetmeats with fishers on the beach for fish, which they then carry into the villages by headload and exchange in return for rice and other foodstuffs. A part of the foodstuffs they keep for their own consumption; what remains is traded for a fresh supply of sweetmeats.

Another time-tested method that poorer producers still use is to retain their niche by not competing with others, especially bigger players. Fish-basket makers are an example. They refrain from making non-fisheries related goods. In return they expect their counterparts in other villages not to compete with them. Another example is that of the dried fish sellers in many east coast villages. They do not diversify into fresh fish sale even if they have access to fresh fish. Doing so would provoke the local fresh fish seller – who is a bigger player – to get into dried fish and marginalise them altogether.

In Pazhayar, fish traders follow a novel practice to beat competition in local urban markets. They alternate between door-to-door sales and sale from a central market place. Traders who sell from door to door sale on a given day sell from a market the next day. Other women would do just the reverse.

There's another other turf-protection strategy that's pretty effective. Many fish traders met during this study follow it. It's simple: pick up a fight with your competitor, out-shout or out-fight her if necessary – till she leaves your territory. They get support from fellow-traders, who have a personal stake in the outcome of such fights.

For a fresh entrant to the business, the best option is to go to a centralised market or sit by the roadside to attract passing customers. Even here, women have to develop some turf-protection mechanisms (such as bribing the local police in cash or kind; cultivating other traders/business establishments in the locality; setting up semi-permanent structures).

How does turf protection work at higher levels in the supply chain? How do the big traders protect their interests? They are prepared to lose money to protect turf. Take this story of a SIFFS society in Andhra Pradesh. The practice of cooperative marketing suddenly increased returns to fishers by 70 percent. Local traders immediately hiked their purchase rates and offered fishers an even better deal. This meant they would lose money, but they were willing to bear the loss so that fishers stopped patronising the society for sale of fish. Likewise, traders from Kerala sometimes buy fish at a loss just to keep up operations.

Self-imposed management measures

Turf protection also happens locally. Take the fishers of Rameswaram. They have reportedly agreed on a management measure: artisanal and mechanized boats in Palk Bay will take turns to fish, operating on three alternate days every week. This is a win-win arrangement. More fish for all and less strife.

The traditional *Karanila* system in Kerala is also about boats dong fishing by turns. The system is perhaps spreading. A key feature: fishers who remain ashore under the arrangement will also get a share of fishing returns on that day. A paid holiday! You keep off deprivation – the main bugbear of other management measures – even without working! Southern Kerala presents a modified version of the Karanila system: crew members go fishing on alternate days.

In Trivandrum and southern Quilon, artisanal fishers have banned the operation of ringseines and trawl nets in inshore waters to protect their fishing operations. Violation of the ban can attract punishments ranging from physical destruction of fishing gear to prosecution in a court of law.

Fishing gears like ringseines draw criticism because they are inequitable – they enrich some, impoverish others. But there's serious concern also about their impact on resources. Ringseines have been banned by supra-village governance structures in Andhra Pradesh and the Coromandel Coast because of their destructive ecological impact. That the bans have failed to arrest the decline in resources is a different matter. But most fishers whom the study team talked to – including those owning the ringseines[36] – were apprehensive about the long-term ecological impacts of the nets.

During the past decade, fisher organisations have imposed a ban on shrimp seed collection in many areas in Andhra Pradesh. They realise that this activity has hurt biodiversity and led to a steep loss in shrimp catches over the years. Likewise, fishers accept the logic behind the seasonal fishing bans, but dispute the time and the way the bans have been put into effect. They benefit certain sections of society at the expense of others, also ignore the impact of the bans on poor fishers.

Technological innovations

The 'technology fix' in fisheries is not new. Many technologies characterised the modernization phase. But what's discussed here is the innovative new uses of some technologies to address current concerns in the sector.

Cell phones have become a valuable tool for fishers in the mechanised sector. They enable fishers to communicate directly with contacts on land as well as with other boats in the vicinity. They can be used to convey messages about potential fishing grounds to fishers who are waiting at a harbour in Andhra Pradesh, who are out fishing at sea in Kerala or Tamil Nadu. The phones can tell traders about the status of catches or landings, so that they are ready to greet arriving boats at landing centres.

Cell phones can tell fishers at sea about the rates for fish in different landing centres. The fishers can then land where they get the best rates, or bargain for a better price with local buyers. Boat owners watching TV can inform fishers about the latest weather forecasts. At present, the area covered by a cell phone is not uniform along the coast. It doesn't extend beyond a certain distance from the shore — but in course of time, as technology improves, the distance may not be a constraint.

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[36] *For instance, the clearest demand for a blanket ban on ringseines in Anichankuppam came from a fisher-turned-trader who had recently invested in a ringseine himself! He believed, so he claimed, that the ringseines were the bane of the sector and would soon bankrupt it, and that the government should take immediate steps to ban it. As to why then he had invested in the net, he gave the usual reply: that the nets paid a handsome return and if he didn't take advantage of it, someone else would.*

The shore-to-vessel communications systems that the Government of Andhra Pradesh has established all along its coast to warn fishers about cyclones or other natural calamities brewing at sea, have been converted by fishers into an effective economic tool. Operators of mechanised boats in Kakinada and Visakhapatnam use the technology to pass fishing-related information from the shore to the vessel and vice versa.

Many mechanised and some motorised fishing boats are now equipped with devices like hand-held GPS and fish finders, especially in Tamil Nadu (where the tsunami programmes may have contributed partly to their spread) and Kerala (where they have been a part of fishing equipment for a long time already).

The GPS has been put to dubiously innovative use in the Annankovil area, where a dispute raged over the use of ringseines. Ringseine operators would pretend to accede to the majority fishers' demand and dump the nets in the sea. But the operators would later set out to sea on an ostensible fishing trip, retrieve their ringseines with the help of GPS, operate them to catch fish, and return ashore after burying the ringseines safely in the sea once more! Such elaborate charades were played out for some months till the ringseines became acceptable in the area.

Steel boats have replaced wooden boats in some parts of Kerala and Tamil Nadu. The steel boats are more expensive but enjoy several advantages over the wooden trawlers: they have a larger carrying capacity, can go out on longer fishing trips, can withstand rough sea conditions better, consume less fuel, don't require periodic maintenance. The recently developed *katla teppa*s of Andhra Pradesh, discussed in Chapter 2, are an example of the other extreme.

Cheap modes of transport like autorickshaws constitute the most revolutionary change in the post-harvest sector – equalling the introduction of ice. For a vast majority of fish traders, autorickshaws have become a lifeline to keep businesses intact. These vehicles are fairly affordable to women and allow them to rush from one landing centre to another to buy fish, reach markets in time and carry larger quantities than before. They should be prepared to overlook certain discomforts, like overcrowding.

Other innovations in fishing, largely as a result of choices made by the fishers themselves, include:

i. Use of fish aggregation devices (FAD) to attract fish, a tool widely used in Kerala.

ii. FRP motorised boats have become longer in Andhra Pradesh, Kerala and Tamil Nadu. The increase in length facilitates ringseine operations in Andhra Pradesh and Tamil Nadu and voyage fishing in Tamil Nadu and Kerala.

iii. Many plank-built boats in Kerala have switched to inboard engines from out-board motors, and made adequate changes to the structure and engineering of the existing designs. In this state, the larger ringseines are operated using a winch.

iv. The shift from trawling to ringseine fishing by mechanised boats in Pazhayar and Mudasalodai and to gillnetting in Arcot Thurai. (These were made possible through a number of changes to the existing fleet — modifications to engines, superstructure and rigging.) Fishers of Kerala added a deck to the FRP boats to facilitate hook-and-line fishing. This fishing method also increasingly employs artificial baits of different shapes and colours (instead of natural baits).

v. Improvised devices for catching new species like jellyfish and shrimp seed. Similar innovations became necessary also to take advantage of other boom-and-bust opportunities.

vi. Trawl nets using very large mesh sizes at the mouth – up to 1,200 – to increase buoyancy and target mid-water species.

vii. Shark-fishing boats use VHF sets so that they can communicate from offshore.

viii. Use of bio-FADS in Kerala to enhance cuttlefish production.

Living for the day

Some activities in fisheries depend almost entirely on temporary props like subsidies. Example: the dependence of mechanised boats on government fuel subsidies in Tamil Nadu. Evidence indicates that mechanised fishing will become largely unsustainable once the fuel subsidy is withdrawn. Fishers are

aware that the subsidy may be phased out eventually. Or the diesel cost may go up so much that a subsidy will become meaningless (as happened in Andhra Pradesh). But fishers are concerned about surviving for the day.

Subsidies also keep adding to fishing fleets. Steel barges (stainless steel mechanised trawlers) in Nagapattinam are an example. Some 30 new steel barges are said to have entered fisheries in the last 18 months, spurred by subsidised credit from banks[37]. This credit was part of the government's post-tsunami relief programme for mechanized fisheries. The steel barges had a very good fishing season last year (2006) – going by the posh new houses that some boat owners have built last year in Nagai. They believe that this upward swing in catches will continue. Given the history of trawling (especially its relationship with institutional credit[38]), it seems plausible that the boats will operate as long as it is profitable to do so. Conditions will then return to what they were before the tsunami[39].

Credit has always been an important prop on which fishers depended. In the pre-modernisation phase, credit was necessary to meet basic consumption needs, mainly during lean periods. In the modernisation period, access to credit enabled investment in new technologies and increased returns from fishing.

In the post-modernisation period, market demand remains as strong as ever. Everyone active in production and trade is creditworthy. It is access to credit that mainly determines access to most other assets necessary for livelihood activities; conversely, the lack of access to credit can be quite disabling. Men cannot undertake fishing without credit for working capital, and women cannot ply their trade without access to credit in cash or kind.

A majority of people must and do take loans to keep working – for fishing operations, fish trade and ancillary activities. It allows them to earn enough to pay back the loan along with interest (which can range from 3 to 5 percent per month) and retain enough to pay for subsistence needs. This is a case of returning to the subsistence economy, where investments are sizeable, returns to the financiers are good and fishers can manage to survive for another day. Whatever surpluses fishers make from their activities see them through lean periods.

A similar point can be made about fishers' interest in several post-tsunami initiatives in post-harvest fisheries. These attempted to provide new fish drying technologies, train people in value-addition and product diversification (mainly fish pickles), and set up group-based marketing initiatives. The fishers were quite forthright in saying that these initiatives would survive so long as support was extended and fold up immediately after. But the support was extended because at least some fishers stood to gain in the short-term.

Boom-and-bust opportunities

Augmenting the fishers' credo of living for the day is an odd feature that seems intrinsic to fisheries. This is the sudden emergence of a new fishing activity or market opportunity. It quickly develops into a big boom that affects everyone and everything in the sector. In the process, it helps some people to make fortunes, it enables many others to survive a few months or years, then it disappears. We call this 'boom-and-bust' fishing, because of its propensity to vanish as quickly as it sets in, almost before anyone can get to size it up properly.

However, there is no denying its importance to fishers. It strengthens the lottery mentality that is considered a characteristic of fishing people everywhere, but more importantly, it props up the sagging fishing economy from time to time by infusing new energy and investment into it.

The amazing rapidity with which fishers take to such new activities, and adapt their systems to better meet their requirements, and just as easily 'de-addict' themselves once the activity goes bust, gives the impression that they were quite prepared to take advantage of such boom-and-bust opportunities, even if they did not know what form these would take. The example of the jellyfish boom would illustrate this point:

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[37] *Which, going by past experience, is rarely recovered, so that is a subsidy by another name*

[38] *See Vivekanandan et al, 1996 for the curious history of deep sea trawling in Andhra Pradesh*

[39] *Notwithstanding their optimistic predictions, which are frequently as good as the last fishing trip, the fishers seemed to know it better than anyone else.*

Until the mid-1990s, jellyfish had been a problem species for fishermen, clogging nets and irritating them physically. Then the jellyfish boom started and spread rapidly to various parts of Tamil Nadu and Andhra Pradesh. Large numbers of fishers diverted their operations to focus on jellyfish. While the activity did not last long enough for people to make huge fortunes, it was certainly lucrative while it lasted and paid fishers quite well. By the early 2000s, the activity went from boom to bust (with hardly a transition phase). It hasn't revived since. The abandoned jellyfish processing infrastructure – huge thatched halls, rectangular salting vats and drying platforms – set up in many coastal villages during the boom is all that remains of the enterprise.

Case study: Jellyfish enterprises in Kaipenikuppam, Villupuram district

The jellyfish boom started in this village about 10 years ago, when a Chennai-based company set up jellyfish processing infrastructure in the village, offered advances to fishers at Rs. 5,000 per head, and paid very good prices for their catches. To catch jellyfish, the fishers developed a new contraption (used by hand) by improvising an earlier trap which was used for crabs.

Jellyfish fishing was a seasonal activity and lasted two months in a year but paid well enough to make it a little bonanza for fishers. A fisherman could hope to earn Rs. 250-300 per day. This soon turned into frenzy as hundreds of people got into the activity. Interestingly, the season for catching jellyfish coincided with that for shrimp, and people opted for jellyfish. The jellyfish mania spread all along the Coromandel Coast and soon everyone was fishing for them.

Meanwhile, the processing company went on a spending spree – providing Rs. 3 lakhs to the village fund, sponsoring village festivals and many other good samaritan projects, helped put up the processing infrastructure in the village commons and also ensured regular flows of jellyfish. It recruited external processing specialists and employed some 50 girls in the village to take part in processing operations. These girls received Rs. 75-150 a day depending on the nature and quantum of work they did, which was quite lucrative by local standards.

The company also provided gloves and eyeshades to the fishers to avoid the irritation caused by jellyfish poison, but the fishers claim to have got used to the poison in a short while and found no further need for the protective measures. The species they caught is said to be less poisonous than others.

Then there came a time – about four years ago – when the jellyfish simply vanished from the catches. The activity came to an abrupt halt and has remained that way ever since. From boom to bust, it took about six years in all. The processing infrastructure was abandoned and the external experts were removed from the area. The processing girls – who were the main losers from the disappearance of the jellyfish – returned to their homes and the fishers moved into their old systems of fishing. Today, mackerel and seerfish are the main species targeted by the boats in the village, while ringseines are the latest boom in the neighbouring villages.

The other good example of a boom-and-bust opportunity was natural shrimp seed collection, which started in many places along the east coast in the period before shrimp hatchery technology was perfected and commercial hatcheries could start catering to the aquaculture demand. The activity encouraged entire communities to abandon fishing and resort to seed collection at all times of day and night all along the coastal areas and especially near the river-mouths and estuaries. The returns were substantial and several fortunes were made as a result of the activity.

By the mid-1990s, a number of factors came together and the shrimp seed boom ebbed. Many people reverted to their original occupations, while others – too poor to get into anywhere – struggled with it for a few more years, but the activity was clearly history.

A few other examples of boom-and-bust opportunities would include:

- The demand for natural broodstock of tiger shrimp for hatchery breeding and rearing purposes. The big sum offered (initially close to Rs. 1 lakh for a single specimen) sent fishers scrambling for live mother shrimp, until many hatcheries became sick units and the price of mother shrimp came

down. Many boats switched to their routine fishing operations, but remain alert to the possibility of netting a live berried female.

- Shark longlining in Andhra Pradesh. This depended on the big demand for shark fins in Southeast Asian markets, and paid so well that it encouraged nearly half the gill-netting boats in northern and central Andhra Pradesh to shift to long-lining. By the early 1990s, the size and catch-rate of sharks came down. Incomes fell. By the mid-1990s, many of the boats switched back to gillnetting.

These unique examples apart, we can't ignore the fact that some of the major initiatives in the sector have boom-and-bust characteristics. The rise and fall of brackishwater aquaculture was a case in point[40], while the rapid rise in FRP boat construction and operations in the 1980s and 1990s in states like Orissa and Andhra Pradesh is another.

The FRP boats flourished for as long as the government supported their introduction. But once the support ended, so did the construction of new boats. The new FRP boatbuilding yards that had mushroomed all along the coast of Andhra Pradesh slid into oblivion. Fishers would still see FRP as an important technology, but it is expensive. Fishers find it risky to invest in the new boats, preferring instead to settle for cheaper alternatives.

The growth of the pelagics-oriented ringseine fisheries on the east coast is intrinsically linked to the tremendous influence that the Kerala markets has exerted on production and market supply chains all along the east coast of India. The Kerala fish supply chain is perhaps the best organised, and the most efficient, system in marine fisheries today, stretching from Kanyakumari to Paradeep on the east coast and up to Karnataka on the west coast.

As a result, returns for fishers have been quite sizeable. In all this, the question that arises is: how sturdy is the Kerala market in terms of consistently absorbing such large flows of fish from everywhere around the country? That it exists is beyond doubt a very positive thing for the sector as a whole, but how sustainable is it? In other words, could this turn out to be another case of boom-and-bust?

Slash-and-burn fishing, or open access with a vengeance

So long as fishers have faith in the capacity of the system to give them something to survive, they tend to act responsibly. But when that faith in the system is gone, there is an anxiety to maximise returns and escape before it is too late. Hence some of the practices that we call 'open access with a vengeance', which can be summarised to mean: 'clean up the sea before someone else does it.' Recent interventions such as steel barges appear to be aimed at quick turnovers and higher rates of return, while the owners knew that these are unsustainable in the long term. The spread of ringseines – overruling fishers' own strong misgivings about the long term implications – is another case of maximising returns in the short term.

The ring-seines target small pelagics and are currently so lucrative that their spread across the coastal areas has become unstoppable. This is despite the fact that it is quite an expensive fishing gear and requires a lot of organisation to be successful. The efforts of some villages to stem the spread of the ringseines and ban their entry have proved futile because ringseines do really prop up the economy in many places.

[40] *This also included attempts to diversify from tiger shrimp to 'scampi' (the freshwater prawn), which seems to be proving yet another instance of boom-and-bust*

In several villages along the Coromandel Coast, ringseines were a post-tsunami phenomenon. Initially there was resistance to their spread and even violent incidents as people from influential villages like Devanampattinam and Pazhayar went to neighbouring villages and set fire to the nets. However, it took only a few months before the same villages switched to ringseines with a vengeance. In several villages, almost all boats have switched to ringseine operations seasonally and fishing activities are being reorganised to facilitate ringseine operations.

Ten boats work together in a ringseine operation. Only two carry out the actual operation, the rest act as carriers. The glut of boats in the post-tsunami period has come in handy for ringseine operations. The influence of Kerala traders increased with the arrival of ringseines in villages and led to a shift from shrimp, cuttlefish and seerfish to pelagic species as the main income-earners in local fisheries. This also led to changes in supply of fish to different market chains, with different kinds of impacts on different stakeholders in each of these chains.

In the short term, ringseines have improved the fishing economy, but fishers say that this may not be a reliable option in the long term. Already, in villages like Pazhayar, the negative impacts are visible. Here, most of the nets were obtained through private finance at 4 percent monthly interest.

The nets are operated seasonally, but the interest is calculated for the year, so the profits from nets go to paying interest. Further, the nets require investment for maintenance up to Rs. 25,000 a year. Having invested heavily, fishers have to continue using the net. If they sell the net, they'll get only a fraction of what they had paid; so their debts will remain, but they won't even have the net as a means of paying off the debt.

Fishers think that the returns from their operations can never really help them to pay off the debt, so their short term strategy is to keep changing financiers: i.e. borrow from one moneylender to pay off another, so that they have some breathing space until the new lender starts demanding repayment. They then take a bigger loan from a third lender and pay off the second one.

The moneylenders are not trader-financiers and have no interest in the transaction except to get a good return on their investment. The SHG set up by NGOs provide loans up to Rs. 10,000, a measly sum compared to the debts, so it is as good as non-existent. In other words, in spite of good catches (at least so far) and good market linkages for them, the activity seems to be unviable. Only two out of the seven ringseine operations in the village have reportedly managed to keep their head above water, while the rest have accumulated big debts.

Other fishers of the Coromandel Coast approach the ringseines as though they are fearful about what they are letting themselves into. "These nets should be banned," they keep suggesting, "and only the government can do that." Then it turns out that the same people who suggest the option have recently invested in a ringseine themselves. They know it is a dangerous net, and very likely to become quickly unsustainable. Still, they claim that it is impossible for them to stop its proliferation; they cannot stop using it themselves because if they don't, someone else will.

They admit that it is a case of a few people benefiting at the expense of many, but they also say that if they did not catch the fish, it would never be caught anyway; that it requires so many people to catch the fish that the benefits reach a large number of people; that the varieties they catch are not consumed much locally, and so on.

The fatalistic attitude of fishers, noted approvingly by a number of earlier writers, seems to dominate some of their choices in this context. Ever-decreasing mesh-sizes in most nets, trawling in near-shore waters – these infractions have caused concern for a long time, but they have gotten worse.

Part-time operations

Thanks to the uncertainties in the sector, some activities have been partially abandoned, others are being undertaken rather sparingly. One-third of the mechanised boats stay put in the fishing harbours of Visakhapatnam, Malpe and Kochi. The boat owners want to be certain of good returns before their craft venture out. They also need working capital. A week's fishing trip would cost them anything up to Rs. 30,000. Being already heavily in debt, they find it difficult to raise fresh loans to operate the boats.

The aquaculture scenario is similar. Many small-scale land-holders invest in aquaculture whenever they manage to save some money — knowing full well that they may not get their money back. Their dabbling in aquaculture is therefore rather like chancing their luck in a lottery. They can't give it up altogether – there's the fond lingering hope of striking it rich. But they can't trust it enough to invest regularly in it.

The shrimp processing plants in several coastal areas are similar. The plants remain closed for parts of the year, operating only during the peak fishing period. They tend to employ workers on a daily wage basis, not on a monthly wage as was the case earlier, and only when there is work to do. The idea is to save on overheads. Shrimp hatcheries are another example of rationalising overheads and production costs through part-time operations.

The FRP/wooden boats lying on the beaches for months at a stretch show that artisanal fishers too are practising "partial abandonment"! However, the fact that the fishers move into other areas for fishing or take measures to reduce costs indicate that the boats do get to be used.

Whenever demand for fish at landing centres is too high, women tend to abandon trading activities and stay at home. Cycle fish vendors are by far the worst affected by increasing competition for fish. They often prefer to seek some other local work in their own communities.

In most of the above cases, partial abandonment of activities does frequently become permanent. This is also a risk-defeating strategy, leading to livelihood diversification (which we shall discuss in the next chapter).

Political strategies

Increasingly, especially in Kerala, an important enhancement strategy appears to be to take recourse to the political process and influence it through advocacy and lobbying.

Examples of such measures:

- the fight for a seasonal fishing ban and for zonation of the sea to protect artisanal interests;
- the protests against anti-fishing measures such as lowering diesel subsidies and setting up Special Economic Zones where fisher communities exist;
- the demands for greater support to fuel subsidies and to welfare measures like savings-cum-relief programmes and universal insurance;
- the stiff opposition to deep-sea vessels of a foreign origin and against the promotion of aquaculture in sensitive areas.

How effective have such measures been in ensuring livelihood security across coastal areas? They have certainly led to a better appreciation of fisher power and the need to include fishers in the decision-making process. Ganjam fishers in Orissa are an example. They besieged the District Collectorate and virtually halted the state administration, forcing it to address the issue of trawlers encroaching into their waters.

Based on the available evidence we can try to understand the need for any category of stakeholder in the fisheries sector to move out of it, and why?

On the one extreme are people who don't need to move out at all (or cannot move out because of investments already made). For these people, fishing will always be the most important livelihood activity. On the other extreme are people who have no fixed assets or bonds to tie them to the sector. They are unable to meet their daily subsistence needs. These are the top candidates for moving out.

Most fishers stand between these two extremes. They must undertake seasonal or regular occupational migration to make ends meet. There is also another facet to livelihood diversification: for at least some people, the shift out of fisheries is a matter of taking advantage of new options and opportunities. The migration to Gulf countries, to Southeast Asia from the Coromandel Coast, and to urban employment by youth from many communities are driven by a yearning for upward mobility (social and economic) rather than by a desperation born out of need.

We can also see other patterns in the diversification process: the extent to which a household moves along the diversification path is rarely a clean jump from one activity to another. This tends to proceed gradually, in an incremental fashion. Bonds tying the household to the old activity are gradually loosened while those linking it to new activities are strengthened — until the new activity gets better integrated with the needs and capacity of the household.

The trouble with such a characterisation of the process (as with the whole idea of alternative livelihood generation) is that it ignores an important fact. Most diversification paths – especially those undertaken by the poor – are rarely unidirectional. They can be bi-directional and frequently bring people back to where they began (as the history of livelihood diversification in fishing communities repeatedly shows). Or multi-directional — they take people in other directions. Or, frequently, static: they keep people suspended in a no-man's land, seemingly content to survive that way.

The point here is that diversification is rarely linear. It is often cyclical, and there are cycles within cycles as individuals/households move between a range of activities, rather than settle for any one alternative. The cyclical nature of diversification strategies once again highlights the need to focus on the existing livelihood, where one can at least be certain about the extent of people's affiliation to specific activities.

Further, the process of diversification takes place along several axes at once, and is characterised by shifts from:

1. Fisheries to non-fisheries activities
2. Local to non-local activities
3. One or two primary activities to multiple livelihood activities
4. Individual to household level
5. Seasonal diversification to regular diversification

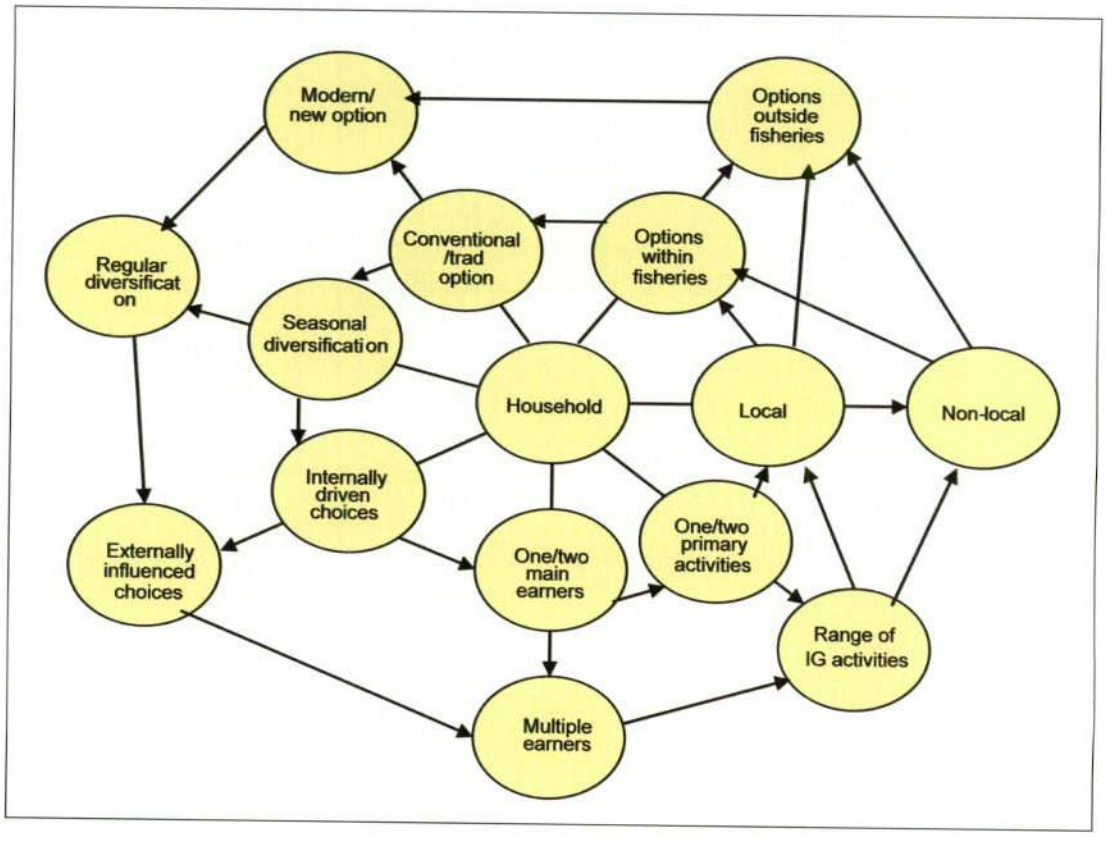
Finally, in the context of post-modernisation and its pre-occupation with alternative livelihood generation, there is a newly emerging pathway which indicates a shift from:

6. Traditional, internal responses (primary sector- oriented) to modern, externally-driven responses (secondary/tertiary activity-oriented)

All this would indicate that the idea of diversification as a linear process must be replaced by a more nuanced understanding, which might look as follows when presented schematically:

In the context of this study, the diversification strategies of the fishers are considered along two axes. These involve a shift (i) from fishing[41] to non-fishing activities and (ii) from a local to a non-local context.

[41] *That is, finding an alternative activity within the fisheries sector – such as active fishers turning into fish traders.*



When livelihood diversification strategies are plotted along these two axes in a matrix, we obtain four options for diversification. The first is the uptake of a new activity in fishing locally, the last stage entails shift to a non-fishing activity in a non-local area. The two stages in between: shifting to a fishing activity in a non-local area; and shift to a non-fishing activity in the local area. . These options are presented schematically as follows:

Local options within fisheries	**Local options outside fisheries**
Non-local options within fisheries	**Non-local options outside fisheries**

These four categories seemed to account for a majority of instances of diversification that this study has been able to explore. An analysis of livelihoods along the other axes (especially in terms of shift from individual to household-based activities) may yield further insights into the whole issue, but this has been attempted only partially in the following analysis. It must be stressed again that the four options are not consecutive stages in a continuum, involving a gradual shift from one stage to the next – each can exist on its own, or in conjunction with one or more of the other options.

Let us now discuss the important livelihood diversification strategies under the four broad areas for each of the three phases in the evolution of fisheries, using examples from field work and from interviews.

A. Livelihood diversification in the pre-modernisation period

Given the subsistence nature of operations in pre-modernisation fisheries, livelihood diversification was an important strategy. It entailed mainly seasonal geographical migration and regular occupational diversification.

Local options in fishing

Given that pre-modernisation did not offer many options for diversification, there are few examples of shifts within fisheries locally. One important diversification was perhaps the shift of fresh fish traders to dry fish trade seasonally. It is also possible that fishers chose to stop fishing with boats during rough weather and instead fished with shore-based nets like shore-seines. During lean periods, the fishers made

changes to their fishing patterns: in Kerala, plank-built canoes shifted from gillnets to hook-and-line fishing seasonally.

Non-local options in fishing[42]

Fishing communities residing close to river mouths or lake mouths, or near backwaters, had access to two water bodies – the sea and the river/lake/backwater. They developed systems to tap both. The fishers of Killai area in Tamil Nadu, for instance, used their wooden *kanna thoni*s for fishing in the backwaters of the area (along with their wives) when the sea was rough. When conditions improved, they reverted to marine fishing, for which they used wooden plank-built boats.

Likewise, the fishers of Arakha Khuda village, located close to the Chilka lake-mouth in Orissa, fished in the Chilka for part of the year and in the sea for the remaining period. Another batch of fishers in the same area would fish in the sea for the best part of the year, preferring to move into the Chilka during lean periods. In both cases, fishers used two different kinds of boats. A similar pattern is also observed with the fishers of Pulicat Lake.

The estuarine fishing communities of the lower reaches of the Godavari fished seasonally in the open seas using the shoe-*dhoni*s, travelling along the coast over long distances (up to Machilipatnam), making the best use of the winds in certain parts of the year. There was also seasonal movement from one marine fishing village to another in a different area, depending upon the condition of the sea.

MFB (1916) reports that the Rampani fishers from Goa, and the Machwa fishers from Ratnagiri and other places in Bombay Presidency, migrated for 3-4 months every year to fishing centres like Malpe and Hangarkatta in South Kanara district on the west coast. The example of southward migration of fishers from northern Andhra Pradesh to fish in the more peaceful waters abutting the region between the Godavari and the Krishna rivers for 3-4 months every year has already been mentioned. But they also undertook a longer migration to the Chilka/Puri belt in Orissa seasonally for shrimp fishing. The fishermen of the southern parts of Srikakulam district moved shorter distances to northern parts of the same district.

One good example of seasonal migration is that of fishers in West Bengal to the island of Jambudweep in the lower reaches of the Hooghly River. A detailed study of the process (Raychaudhuri, 1980) highlights the affinity of fishers for the sea and how, even when forced to shift to 'non-caste' occupations, they kept looking out for an opportunity to get back into fishing.

The detail that went into selecting a fishing site in a new location and the organisation of the fishing units, the knowledge that the fishers had about their immediate environment, and the technology they used, provide rare glimpses into a complex and fascinating process. Some of the important conclusions of the study, which are applicable to most migrant situations, were:

1. The transient community consisting of male fishers living away from their families develops a moral order to sustain group cohesion;
2. In order to cope with a very difficult technological task, the fishers develop an elaborate cultural inventory of *rational* technological knowledge;
3. The fishers seek systematic support from supernatural beliefs to cover the risk of great uncertainty in catch and the danger of environment. This also contributes to a certain degree of fatalism in their world-view and a tendency to view their profession in the spirit of a gambler.

The most important long-term migration involving inter-state travel dating back to the pre-modernisation period is that of fishers from northern coastal Andhra Pradesh to Orissa. The origins of this migration – dating back to 1940s – remain obscure, but whatever their origins, the Andhra Pradesh fishers in Puri established themselves into a vibrant economic force in the region.

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[42] *Most non-local options in fishing, which involve the pursuit of the same livelihood activities from a different area, are treated in this study as diversification strategies although they would merit being considered as 'enhancement strategies'. Reason: Making a distinction between plain geographical shifts and geographical shifts involving occupational diversification would be confusing.*

But for the fact that the fisher was operating from a different place other than his native fishing village, nothing changed in the way he worked in Puri – he used the same boat, operated the same gears, and caught more or less the same fish but in larger quantities. Considering the linguistic and cultural difficulties, coupled with illiteracy, it must have been quite a feat, not only in terms of securing a place in the host community, but also consolidating it, while at the same time continuing their links with their native places.

Another interesting long-term geographical migration was that of the shoe-*dhoni*s of East Godavari district. The boat is interesting because it is more than just a fishing craft. An entire family of fishers – consisting of men, women and children – live in it. All of them make a living collecting shells. The fisher families come from different villages within a radius of about 50 km to this landing centre, and they spend about 10 months in a year at a particular creek. Lack of suitable livelihood opportunities in their villages is the reason fishers have adopted this kind of lifestyle.

The island villages from where they came offered limited opportunities for anything other than fishing. The many fishing villages in the lower reaches of the Godavari delta made competition for fishing fierce, forcing some of the fishers to move out seeking alternative options. The shoe-*dhoni* fishers found an unexploited niche: the mollusc shells growing in the sea bottom near the creek where they lived. The biophysical conditions of the substratum on which the molluscs grow made it all but impossible to collect them by any means other than manually, and the shoe-*dhoni* fishers applied themselves to it.

So long as the shoe-*dhoni*s concentrated on shell collection, without competing with the locals for fish, the local communities accepted their presence in the area. Many of the shoe-*dhoni* fishers had permanent houses back in their villages, but they were more at home living on their boats, and made many modifications and adaptations to it to suit their needs.

Local options outside fishing

Occupational diversification is not always a seasonal adaptation: it is the norm in many fishing communities for different members of a household to undertake a range of activities outside fisheries throughout the year, to cope with the uncertainties inherent in fishing. Similarly, one person sometimes engaged in different activities in different periods of the year, depending on the fishing conditions and the availability of alternative opportunities.

Thus, the *Mukkuvar*s of the Malabar Coast[43] were not merely fishers, they also worked as boatmen, as palanquin bearers, as coconut cultivators. Some of them took up government jobs, rising to such high-ranking positions as sub-magistrate and sub-registrar (Thurston, 1909: V-106). Kerala women worked in coconut coir extraction and rope-making activities during lean periods for use in fishing activities. *Moger*s, the Tulu-speaking fishers of the South Kanara district, worked in Government fish-curing yards, and also took to agriculture, oil-pressing, and playing on musical instruments (Thurston, 1909: V-67). Some of them worked as palanquin-bearers and as cap-makers.

The *Palle* or *Agnikula Kshatriya* fishers in the central Andhra Pradesh coast had a varied occupational profile as cultivators of paddy, salt producers, mollusc-shell collectors, lime-makers, firewood collectors and sellers, besides fishing in the creeks and in the sea. Fishers from the marine fishing caste of *Vadabalija* in northern Andhra Pradesh also owned agricultural lands, cashew nut and casuarina plantations.

The employment of women as wage labourers in agriculture was an important livelihood strategy in several fishing villages of Andhra Pradesh. The rainy season (when fishing was very uncertain) was when agricultural operations like seeding, planting and harvesting took place, which meant that the women could undertake such tasks without losing their fish businesses. In fishing communities close to urban areas, the fisherwomen sometimes served as domestic help.

Such diversification also existed within particular fishing systems: the shoe-*dhoni*s mentioned above, for instance, collected mollusc shells from the sea bottom, collected firewood from the adjacent mangroves and caught fish partly for their own consumption and partly for sale. They also reared chickens onboard for eventual sale.

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[43] *The references to 'Malabar' come from colonial sources like Thurston and the Madras Fisheries Bureau, and pre-date the formation of Kerala state. This leads to some confusion as to whether Malabar was meant to include a much wider area than it currently denotes.*

Non-local options outside fishing

The most important and well-documented instance of migration outside the local area into largely non-traditional occupations is that of coastal people from the erstwhile Madras Presidency to Malaya and Burma in the 19th century. The migrants belonged to different communities, from the Coromandel Coast to Ganjam. Satyanarayana (2001) presents a good description of the structure and organisation of this migratory process. A brief summary:

> The extensive growth of export-oriented crops in Malaya and Burma created a massive demand for unskilled/manual labourers. South Indian labourers met the demand. Cash advances, regular work opportunities, money wages – three to four times the wages they received in India – and the prospect of making a fortune served as a powerful allure for labourers from across the Bay of Bengal.
>
> Although the Coromandel Coast had regular trade and commercial contacts with lower Burma and the Malay Peninsula during the pre-colonial period, it was only after the 1870s when the regular fortnightly/weekly steamer services were introduced, that the number of emigrants from south India rose sharply. While the migration to Burma was dominated by people from the Andhra origin, that to Malaya was dominated by people from the southern districts of Madras Province – which included the coastal districts of Pudukkottai, Tanjore, Ramnad and Tinnevelly(Tirunelveli). Fishing communities contributed sizeable numbers of people to the migratory process.
>
> Natural calamities were an important push factor for these migrations: a definite correlation existed between natural calamities and increased migration. Crop failures, bad seasons, monsoon failures and famines had a significant impact upon migration. The oppressive caste system was an important push factor for those belonging to the lower strata of society.
>
> The migrants worked in rubber and timber plantations, besides undertaking a host of unskilled jobs – rickshaw pulling, sweeping and scavenging, working as labourers in rice mills, harbours, and ports. They were also employed in sawmills, oil wells and refiners, shipping companies and harvesting. The South Indian labourer was considered the most suitable for the simple, repetitive, and routine work that had to be done on the plantations and they were also "malleable, worked well under supervision and... easily manageable. He had fewer qualms or taboos than his northern fellows, and cost less in feeding and maintenance".
>
> An important point to note about this migration: it was very male-centred: in Burma, during 1921-31, the number of women for every 1000 men was 208 among Telugu people, while it was 430 among Tamils. A great majority of migrants stayed for two to three years before returning to India, where they became quite well to do and bought landed property and other assets in the rural/urban areas.

During and after the Second World War, which had serious consequences in terms of drought in the Bengal region, many fishers (among others) were forced to leave their homes and spread out into different areas seeking work: some of them ended up in the West Bengal and Bihar, working as scavengers, and some of them went to the north-eastern states of India to work as plantation labourers. Several also took up urban-based jobs, mostly as unskilled labourers.

On the west coast, a large number of *Mogers* from South Kanara regularly migrated to Bombay to work as 'peons, watchmen, and attenders for big mercantile firms, banks and shops' (MFB, 1915:47) and returned home after a few years' stay there 'with decent sums of money in their pockets'. There were 'very much improved in their ideas and manners and are better off than their stay-at-home brethren'.

B. Livelihood diversification in the modernisation phase

In an obviously flourishing economy, where surpluses were sufficient to address seasonality issues, and 'fish famines' (as well as more general 'drought' conditions) largely avoided the sector, the extent of out-migration was much less than in the previous phase. The out-migrations that did occur were driven more by the pull factors – the opportunity to earn more or obtain a better quality of life – than by the push

factors. On the other hand, as we have seen, the phenomenal growth of the fishing economy and the new opportunities this gave rise to contributed to large-scale in-migration.

Local options in fishing

For many fishers, this is perhaps the most feasible option to diversify into because they know the systems and processes in fisheries and their own strengths vis-à-vis available opportunities. As regards other options, they may be unfamiliar with the environment or their specific choices or both. When an active fisherman chooses to change his profession from fishing to the fish trade, he is tapping his strengths, as the following case study from the Godavari delta in Andhra Pradesh illustrates.

Case study: KV, Fisherman-turned-fish trader,

BCV Palem, Andhra Pradesh

KV (36), a fisherman with a boat of his own, stumbled into the fish trade some seven years ago, when he received an offer he couldn't refuse. He had bought crabs for his own consumption, he had paid Rs. 9. The buyer offered him Rs. 30, and KV became a fish trader the next day. Initially, he bought fish in his own village, carried it to the nearest town for sale and returned home by noon with a tidy profit.

The advantage with this arrangement was that he did not need to invest much, and he could get fish on credit from his friends and relations. Over time, he moved to a larger fish landing centre for supplies and began to supply fish directly to a trader in Hyderabad, which was 12 hours away by bus.

KV's choice for sourcing supplies was based on his connections in the area. Whenever he is delayed, his contacts at the landing centre buy fish for him and keep them in ice. Although he pays for this service, he says it isn't rendered just for money. His relations with fellow-locals ensure help with transport, packing, and storage if necessary. They also protect him against the local cartels that could ruin small traders like him.

KV says that what he lacked in business acumen, he made up with his knowledge of the quality of a fish from its external appearance, thickness, colour and texture – something that professional traders in the area lacked. Sending fish to Hyderabad taught KV some lessons. He always uses a known transporter to carry his fish – it means lower cost and better reliability. He keeps everyone connected to his business in good humour by handing them a few fish. This ensures that the fish get transported without hassles and in time. Knowing that he cannot get his fish back or hold on to them until he can get the best price, he tries to sell dear when the market can bear it, sometimes for a loss when necessary.

Currently, KV is broadbasing his sources of supply. He patronizes several landing centres to reduce risks from a single supply source. He has also acquired his own vehicles to rapidly move the fish. He puts the vehicles to good use by hiring them out to others for cash or kind – this means some money even during lean periods.

He says that his knowledge of fish enabled his entry into the fish trade. Knowledge and experience in dealing with markets will now help him take the next step: trade in other commodities, like onions and vegetables.

This process of going from strength to strength unfolds further in case of KP, a prominent fisherman-entrepreneur from Puri.

Case study: KP, Puri

KP is one of the most prominent names in fisheries in Orissa and Andhra Pradesh. He began life as a fisher himself, and gradually ventured into the fish trade in the early 1980s, when the demand for fresh fish in distant urban markets (Chennai, in particular) began to mount. He used to send seerfish, pomfrets and other high-value fish, properly iced, in bamboo baskets, by train to Chennai, and later to Kolkata.

Seizing an opportunity offered by the Bay of Bengal Programme, which was looking for an experimental boatbuilding yard in Orissa, KP started one and developed it into a premier FRP boatbuilding unit in the region. His strategy for selling boats was simple: the fishers would get a boat after making a down payment. They had to pay him the rest of the money in kind, by selling their fish to him. Since he was providing the boats, he also took a dealership for supplying nets and engines and spare parts, and he set up a mechanical shed to take care of engine complaints. Then he bought an ailing ice factory; it kept him supplied with ice to serve his trade needs and generated a tidy profit through sale of ice to other traders. He then moved to Andhra Pradesh and set up a few boatbuilding yards there as well. In short, his enterprises covered almost every fisheries-related need of a fisherman — though neither KP nor any of his close family members did any fishing anymore.

There are several stories like KP's all along the coast. The key point to note is that the entrepreneurs invariably drew upon their understanding of the sector and its inhabitants while starting out. It is rather difficult to find such 'success stories' when discussing the other diversification streams.

An important shift took place within fisheries in the modernisation period. People moved in large numbers from artisanal fishing to the more prestigious motorised/mechanised operations.

When the new export and urban trade supply chains took root in coastal fishing villages, some of the more affluent – or enterprising – people in each village became collection agents for traders/exporters and received a commission or a share. The advantage for the processing companies in working with local people – who had also some clout in the villages – was in being assured of regular supplies as well as ensuring prompt recovery of 'advances' they made to boat-owners. Over time, when they understood how the system worked, many of the erstwhile commission agents broke away from the companies, provided 'advances' to boats on their own and set up independent collection points to sell fish to the highest bidders.

Still later, when shrimp export markets began to fluctuate, the companies themselves encouraged their agents to become independent traders to avoid providing large advances. The traders moved away from the export trade and into the domestic urban trade. Still later, they moved on to other pursuits, returning to the fish trade whenever an opportunity arose. Some of these later pursuits included providing finance to fishers, but strictly on cash terms and with interest. The fishermen-turned-financiers know better than to provide loans for repayment in kind.

A major shift within fisheries is that of women in the fish trade or traditional processing operations, who took up employment in shrimp peeling, grading, freezing and packing activities; for quite a large number of erstwhile fish sellers, the shift to shrimp processing industries had been a big opportunity and they would make this their main livelihood activity in many states, especially Kerala. Several women found employment as fish transporters on the beaches, carrying fish from landing centres to packing and temporary storage warehouses of large-scale traders catering to distant urban markets.

Shrimp peeling

Shrimp peeling is a laborious and tediously repetitive work. It means much physical discomfort. But it is also the best option for people whose major asset is a capacity for hard work: the poor. It's a manual activity, even big processing plants must employ the poor to do this. In Kerala, it has developed into a cottage industry. Women have the opportunity to work from home or at a centralised social space. The women work with a product they know all about and are doing something that calls for special skills that few others have, and there is consistent demand for their services. Put simply, shrimp peeling offers perhaps the best deal in terms of a livelihood opportunity for several poor people.

Another important example would be the shift of people in marine fishing communities into coastal aquaculture in several areas on the east coast and, to a lesser extent, on the west coast. In Andhra Pradesh and the Cauvery basin in Tamil Nadu, fishers (besides a larger number of people from non-fishing communities) moved into aquaculture. They were helped in this process by government support through favourable land-lease policies, technology and infrastructure support and creation of backward and forward linkages. In some areas, e.g., in Krishna and Nellore districts of Andhra Pradesh, the fishers divided the village commons among themselves and abandoned fishing altogether to get into shrimp aquaculture. The new work opportunities aquaculture generated helped a number of other people to find seasonal employment in the operations.

A few fishers also found employment in engine repair and maintenance work, but their numbers were low because of three reasons: only so many technicians were needed in a village[44]; it called for some basic literacy before one could be trained; and several people from non-fishing communities were already in the trade.

Several fresh fish sellers, finding it difficult to obtain fish, changed to being resellers on the beaches. The process of 'reselling' involved nothing more complicated than bidding for fish in an auction and selling it to another party for a small margin. Obviously, the value added to the product or to the supply chain by these people appears to be limited. But their role is one of distributing the surplus across a larger number of people in the sector. By buying fish in bulk and reselling them in smaller quantities to small-scale operators, they give these poorer stakeholders access to fish. In a context where bulk landings reduce access to fish for poorer buyers – ringseine landings are an example – the resellers perform a useful social and economic function. .

Case study: Anjalakshi, fresh fish vendor, Kaipeni Kuppam

Anjalakshi, 60, was selling fish in neighbouring towns like Marakkanam, going as far as Pondicherry, which was some 50 km away. With age, she found it difficult to compete with younger women and decided to slow down. She noticed that competition for fish at landing centres was confined to specific times in the day when large numbers of traders congregated on the beaches. At other times, whenever a boat landed its catch, there was not much competition.

Anjalakshi started procuring fish during the non-peak period and found a new opportunity – she would buy the fish and re-sell it to cycle vendors who came to the village at a later hour. So she could earn some money without moving from the village. Nowadays, the cycle vendors ask her to buy specific varieties of fish for them and store them until they could come to pick them up, paying her rather well for the service.

[44] *Unlike tailors, for whom apparently there is an insatiable demand in villages, going by the numbers of women trained as tailors under various livelihood support programmes.*

Non-local options in fishing

After local options in fisheries, those in a non-local context appear to be the most important for the fishers, mostly the men. The non-local options could be within a state, as for instance, the shifting of marine fishers in some northern zone villages of Andhra Pradesh to reservoir/inland/riverine fishing; or it could be inter-state, involving the seasonal migrations of fishermen of Tamil Nadu to Kerala and the long-term migrations of fishermen from Srikakulam district of Andhra Pradesh to Gujarat; or it could even be international, involving the long-term migration of fishers from Kerala to Gulf countries.

Access to more efficient technology meant that fishers could travel farther than before, allowing them to undertake seasonal long-distance migrations to fish from a different area during lean periods. A good example of this would be the seasonal migration of the fishers from Andhra Pradesh to Puri and Paradeep – a well-settled fishing community in the area acting as a motor for these migrations. An interesting feature of the seasonal migration to Puri (and to other parts of the Orissa coast, whose fisheries wealth was largely under-exploited) is that even non-motorised boats would undertake the journey. They would hire a mechanised boat to tow them in a group to Puri or to the Chilka lake.

A number of short-distance migrations became possible in the modernisation period with the development of infrastructure, communications and transport facilities. The migration of fishers from southern Kerala to northern Kerala was a seasonal feature, encouraged by local fishers themselves. But over time, the local fishers have acquired skills and became proficient fishers themselves, so the migrants are no longer pampered as before. In fact, in some villages, they are only allowed to work on local boats, but not bring their boats along (see also the section on Protecting Turfs at Sea).

Another example of inter-state migration was that of fishers from the west coast of Kanyakumari district to Kerala for most of the year. Long-liners from Thoothoor (targeting shark and tuna) are stationed in Kochi for nine months in a year and go to their native place only for village festivals or for Christmas. The movement of fishers from north coastal Andhra Pradesh to various places in the central and southern zones – leading to some new accommodations, some new conflicts and some new long-term settlements — is an example of this process.

Yet another kind of geographical migration was that by trawlers from different places on the Coromandel Coast operating from Jagathapattinam (and other major towns bordering the Palk Bay), where the sea was calm and offered good fishing (Bharathi, 1999:79-80). The interesting part of this 'migration' was that the trawlers were operated throughout the year from Jagathapattinam, while the owners and some of the crew members recruited from villages made periodical trips to their home villages. In any case, only a few crew members were recruited from the villages, the rest were employed in Jagathapattinam itself. Bharathi (1999) calculated that more than 80 percent of the trawlers from places like Karaikal were operated from Jagathapattinam regularly.

In the 1970s, many fishers from different coastal states were invited to settle in the Andaman Islands by the Government of India in a move to enhance the productivity of the local waters.

A good example of a non-local migration within fisheries is that of the girls from fishing households in Kerala to many coastal states in the country for working in shrimp processing factories.

Case study: shrimp processing girls of Kerala

Processing of shrimp was a manual operation requiring special care, skills and patience and had all along focused on women. Girls from Kerala fishing households, in particular, were reputed for skill with peeling operations. Shrimp processing companies in every state employed Kerala girls, paying them a higher salary than that paid to local girls. The recruiting agents of processing companies would visit villages offering advances up to Rs. 20,000 for recruiting each girl.

Conditions in many fishing households in Kerala were such that the girls were more than willing to take the offer and get away from the status of non-paying dependents. The girls were recruited in groups, making it easier for them to take the offers. Their families could look forward to receiving the girl's earnings (partly to pay for her eventual marriage), while also saving on the girl's living expenses at home.

Shrimp processing was very hard work, often characterised by long working hours, poor working and living conditions, lax institutional safeguards and no insurance. Yet, the girls preferred such work to staying at home and being looked upon as a burden. They shifted from one company to another and from one state to another, drawn by the promise of higher wages and greater comfort at work.

Local options outside fishing

One industrial activity where the men did find good opportunities of work was in port operations. In Chennai, Kochi, Visakhapatnam, Tuticorin, Paradeep, Gopalpur-on-Sea, Kakinada and Kandla (in Gujarat), fishers play a major role in several port operations and also regularly rent out their boats and other equipment for various purposes. Fishers in Vizhinjam work as labourers in loading and unloading operations whenever ships from Lakshadweep arrive; this gives them work for two to three days in a month, but they make good money during this period.

Tourism is another source of jobs. In a major tourist destination like Kerala, which promotes the charm of its backwaters, the opportunities available to fishers, both men and women, are many. The men run pleasure boats, the women are hired by the hotel trade.

Case study: Tourist trade in Trivandrum district

In the coastal area between Adimalathura and Kovalam in Trivandrum district, tourism offers fishers jobs aplenty: as security guards, lifeguards, office assistants, drivers, restaurant waiters or hotel assistants. Young women work as cleaners, maid servants, gardeners and receptionists.

Fishers set up kiosks to sell fruits, handicrafts and other trinkets, some youth rent out umbrellas to foreign tourists, some serve as tourist guides and take guests out to the sea on pleasure trips. Many fishers set up telephone kiosks and travel agencies, offer taxis for hire, run grocery stores – mainly catering to tourists. Some locals work as labourers in the construction of resorts, and they keep coming up. Some tourists want to stay longer in Kerala, and this is a bonanza for house-owners by way of rent and food. The rapport that frequently develops between fishers and Western guests leads to substantial support for education, children's marriages, even for new houses. Some youngsters even get short term opportunities to work abroad.

Another long-term occupational shift occurred in some communities when the first generation of educated youth in the modernisation period got jobs outside fisheries — both with the government and the private sector. .

Non-local options outside fishing

The most important examples of non-local jobs outside fisheries are those of fishers migrating from Kerala to the Gulf. Although Tamil Nadu and Andhra Pradesh also have many migrants to the Gulf, Kerala is perhaps India's largest contributor of manpower to the Gulf. In fact this phenomenon has created a remittance economy that boosts the state's GDP.

Gulf-Remittance Economy in Kerala

The opportunities for migrating to Gulf countries started in the mid-1970s, following the oil boom of the early 1970s. The economies of Gulf countries were flourishing, creating a huge demand for skilled and unskilled labour. The west coast of India had a long tradition of doing business with the Arabian peninsula. Kerala was quick to take advantage of emerging opportunities. The biggest incentive for going to the Gulf countries was the astonishingly high incomes it offered. Fortunes could be made within a very short time, and most people went there with the idea of returning after a year or two.

The work areas of the migrants varied from oil fields to private homes (as domestic servants). The latter far outnumbered all other categories. It's mainly women from poor households who chose to work as domestic servants. The migrant's lot in the Gulf was not easy. However, the prospect of being able to go back with loads of money if they slogged for a few years kept the migrants there. The money these migrants sent home improved the conditions of their families quite significantly. It even spurred a boom in the local economy in many areas.

Kerala's high social development index is powered partly by Gulf remittances. Children went to schools, health care became affordable. Many people did return from the Gulf, some of them turned into suppliers of labour and helped send thousands more to the Middle East.

The flip side, however, was the explosion of a 'get-rich-quick' mentality among the people, an obsession to migrate to the Gulf at any cost. The ready supply of labour, some of them willing to work at low wages; competition from Bangladesh and other developing countries; visa hassles; and harsh work conditions – these combined to make life tough for migrant workers.

The migration of fishers from the east coast of India to Gujarat, which would turn into a flood in due course, had just begun. It was stimulated by the prospect of good wages and other incentives offered by boat owners. This is an example of a geographical/occupational shift within the sector; artisanal fishers from Andhra Pradesh and Orissa had moved into the mechanised sector in Gujarat.

C. Patterns of livelihood diversification in the post-modernisation phase

Since the post-modernisation phase in fisheries has been crisis-ridden, examples of livelihood diversification (as those in livelihood enhancement) largely take the form of coping mechanisms to survive the crisis. This is why many examples in this section deal with shifts into non-fishing activities.

Local options within fisheries

In Kerala, the returns from mechanised fishing being barely sufficient for survival, many fishing crew on mechanised boats find the need to shift into the artisanal/motorised sector during the seasonal ban periods to make ends meet.

Many bicycle fish vendors moved out of their trade because of competition in the post-modernisation phase. But several new bicycle fish vendors entered the sector because of pressure on livelihoods in other primary sectors.

Many people with a non-fishing background in the Parangipettai area entered the fish trade because it required little investment: all they needed was a bicycle, a basket and an investment of Rs. 500 to Rs. 1,000. Even some graduates entered the fish trade in the area, because there were few other opportunities locally. The bicycle fish trade ensured at least Rs. 100-150 a day — more lucrative than comparable occupations in other sectors.

Fishers[45] have found that the shift to aquaculture is a short-lived option for a number of reasons (involving ecological, technical, social and legal complications). They have therefore returned to their traditional activities (mainly fishing), while some have taken to the fish trade or to wage labour in aquaculture.

[45] *From the fishers' perspective, there was another crucial problem with aquaculture: they had to wait for three months for returns on their investment. This was acceptable to agricultural communities that are used to such timeframes. But for fishers, whose economy is based upon daily returns from fishing, it was a difficult routine to get used to.*

Non-local options within fisheries

The following case study about the migration of fishers from Srikakulam district in Andhra Pradesh to Gujarat shows many parallels with the experiences of Kerala girls, indicating that the basic motives and the larger patterns of the 'migrant experience' remain mostly the same everywhere.

Case study: Srikakulam migrants in Gujarat

The increase to Gujarat's mechanised fishing fleet during 1975-95 gave rise to labour shortages and a compulsion to hire crew from the fishing communities of Andhra Pradesh. The Srikakulam migrants' capacity and willingness to accept work at almost any terms was an asset and they were recruited in large numbers. Six important factors seem to have encouraged the fishers to make the move: the promise of a regular salary; advances offered right at the beginning; opportunities to work with people from their own area; the comfort factor in shifting to a superior technology; the presence of a well-settled 'pioneer' community in the area (which originally gave them the idea of going to Gujarat); and the opportunity to earn enough to pay off accumulated debts and take care of other pending expenditure.

The number of migrants to Gujarat increased through the 1990s, accounting for 43 percent of active fishers in the district by 2002-03. The fishers generally start migrating in August and spend the next nine months fishing with trawlers. During their residence in Gujarat, they spent their entire time onboard the trawlers. It was a life full of risks and hardship, ill health and little access to basic human rights. Salary payments were irregular. There was no leave. They hardly spent any time on the shore. Medical facilities were poor, there was little contact with their families. Over time, the salaries they were paid remained constant or even fell because of poor catches and increased competition for work.

The system of middlemen creates a dependence that mitigates against the interests of the fishers. Meanwhile, the conditions of their families back home in their villages are a matter of concern, with the burden of running the family falling on the women.

The lack of any institutional mechanisms to help them cope with their conditions better and improve their access to basic services and human rights, is a major gap. If many fishers still opt for the Gujarat option, it is because the conditions in their villages are much worse.

One must bear in mind that several fishers do earn well enough to take care of all their needs, and also indulge in conspicuous consumption. The boat captains (who double as labour contractors) earn so well that they actually are a class apart in many villages. The hope of making it to the rank of captain makes many people continue.

Migration abroad for fishing began with the Gulf. During the late 1990s, migrant fishers from Kerala – already in the Gulf on other jobs – found opportunities there in fishing. Their prior experience with hook-and-line operations alongside gillnets stood them in good stead. Local boat-owners were impressed enough to employ fishers from the Kerala region (even importing many for the purpose) in fishing operations, though there were fishers among the migrants from Egypt and Sudan as well.

Of late, some of the migrant fishers have reportedly managed to become owners of their boats. From Mudasalodai on the Coromandel Coast, some 10 families migrated to Qatar to work as crew on local boats: the fishers were considered to be skilled experts and were invited to work on local boats on a share basis. They return to Kerala every 2 to 3 years and spend about six months at home before returning to Qatar. But some of them prefer to settle back for good in India and take to fishing on local boats. It is said that the migrants' earnings from abroad are invested in agriculture, commercial establishments and houses, but seldom in fishing.

Local options outside fisheries

In the post-modernisation phase, women in fishing communities returned partly to their pre-modernisation role as distributors of fish. But because of the competition in the fish trade, many women moved out into a range of wage-based activities in other sectors. Orissa fisherwomen are an example.

Case study: Fisherwomen in other trades, Ganjam district, Orissa

In the late 1990s, fisherwomen in several villages of Ganjam district in Orissa had to diversify out of fishing. Reason: the men found fishing increasingly problematic. Trawling boats encroached into their traditional fishing grounds and caught important fish varieties. What's worse, they damaged the nets and boats of the fishers.

The women were used to serving as seasonal agricultural labourers in neighbouring villages. Now the number of women taking up this vocation went up manifold. They travelled farther out, working as far away as 40 km from home. Agricultural work being seasonal, the women also started working in Gopalpur port, loading and unloading goods. Some women started working in the government's social forestry programmes, while others found work as servant maids in hotels in Gopalpur.

Several women would travel to the nearby Berhampur town and find work there in local business establishments and as domestic help. Some women worked as construction labourers, and learned their trade so well as to become skilled workers and even masons. Some women opened petty shops in villages, others made sweetmeats for carrying to Berhampur for door-to-door sale. Some women collected flowers of a local wild herb, used to make fragrances, while others used its leaves to make mats.

The women also kept eyes and ears open for opportunities in fisheries. When the trawler menace subsided, many of them returned to the fish trade. To the extent that their circumstances would allow, the women tended to pursue two trades simultaneously.

Apart from the versatility of the women, what is important to note here is that the new activities they have moved into have a strong local orientation and are hence easily accessible to them. The other point is that some of the activities are as seasonal as fishing itself. The women have converted this to their advantage by developing a range of complementary activities, keeping themselves employed round the year.

In some other places, the process of out-migration is still at an early stage. It continues to remain an important source of income for fishers, because conditions in fishing still remain uncertain. Many activities that the fishers have moved into are often no more viable than those they had left behind. Sometimes these alternatives are desperate measures. This is particularly true of the activities undertaken by the poorer categories of stakeholders – asset less labourers, single-women – whose employment potential as 'unskilled labourers' remains very low.

Moreover, unemployment and under-employment are endemic in major livelihood-generating sectors like agriculture, and the influx of new workers will further aggravate conditions for people already depending on them. For instance, in some coastal districts of Orissa and Andhra Pradesh, where the fisherwomen moved in large numbers to work in agriculture as wage labourers, this led to a glut in labour supply and depressed the wages for *everyone*. Result: resentment against the new entrants and social tensions.

On the Coromandel Coast, the diversification of women into other occupations in the neighbourhood is not very pronounced. This has partly to do with the fact that the relations of the *Pattinavar* communities with their agrarian neighbours have always been rather frosty. In this area, fishing is considered with justification to be better-paying than other comparable occupations. The fishers simply cannot afford to 'stoop' to work as labourers in agriculture. Perhaps the most important reason fishers of the Coromandel don't show interest in moving out is that the earnings from fishing and the fish trade are still sizeable, compared to those from other activities. As the leader of a women's group in Anichankuppam explained:

"If we worked in agriculture, we would get Rs. 25 for a full day's work, while we can easily earn Rs. 100 for the same amount of work in the fish trade. Agricultural work is seasonal, while the fish trade is round the year, and provides ready income too. We know the ins-and-outs of this business and can survive without soliciting anyone's help, but with agriculture work, we feel lost."

Thus, both on the Coromandel Coast and in Kerala, when the women needed to diversify out of fishing, their first option was to take over the petty businesses within their own communities, which had until then been being run by people with a non-fishing background. Various local trades – the sale of rice, groceries, meat and vegetables and other essential items in daily use, eateries (where women sold idlis) and textiles – were taken over by women from fishing communities. These trades were local, needed low investments, catered to steady demand.

That these employment opportunities displaced some people already in those businesses – who would be equally poor – illustrates the point about livelihood diversification frequently being a zero sum game: one gets a new opportunity by displacing another.

Case study: Manimegalai (35), textile trader, Anichankuppam

Manimegalai, a housewife until five years ago, started a textile business because her husband's earnings from fishing could not meet the needs of the household. She could not get into the fish trade, too much competition there. Moreover, with four children to look after, she had to work from home. She got the idea of selling textiles from observing another family, which pursued the textile trade in the village before shifting to Chennai for good.

After this family left, the village had no resident textile trader, but sellers from outside paid regular visits. With the help of this family, she got into business by taking a neighbour as a partner and obtaining her merchandise from Chennai. She tailored her business to fit in with the local fishing cycle: for instance, she sold clothes on credit, getting an edge over other traders who either did not extend credit or charged exorbitantly for the privilege. She also stopped recoveries during lean periods; she was happy to collect her dues on a daily basis (which was how a majority of fish traders organised their economies). This meant that her business grew quite well and soon reached a monthly turnover of Rs. 50,000.

"Earlier, people had no choice but to take whatever the traders brought here. Now I make sure to see that there is more choice, in terms of designs, material or colours," she says. Since she began her trade, the number of clothes merchants visiting the village had come down. She also leaves some of her merchandise with her friends and relatives in neighbouring fishing villages. They sell the merchandise locally and Manimegalai pay them a commission for this. Significantly, she says she does not sell her clothes in non-fishing villages in the area because the other communities cannot afford the clothes she sells.

Proximity to a town or a city appears to significantly improve the options for diversification by fishing communities. Within Villupuram district, while women from villages to the north focus on the fish trade or simply remain at home, those in the southern villages (bordering Pondicherry) are a lot more versatile and pursue a range of occupations in the town. The phenomenal growth of the urban middle class, coupled with the growing numbers of families where both men and women work, has led to a major demand for domestic labourers. Women from fishing communities fill the need in many coastal towns and cities.

There is much less evidence of men migrating out of fishing locally. Social barriers and status concerns seem to inhibit them, although such concerns do not seem to be important to women. One instance of men moving into another primary-sector activity locally comes from Puri. The men are reported to work seasonally as wage labourers in cashew-nut plantations in the neighbourhood. Fishermen in several villages along the Coromandel Coast feel that there is a need for some of them to move into alternative occupations, but these cannot be traditional ones like agriculture – they don't pay well and are considered 'lowly' anyway.

For many fishers on the Coromandel Coast, as elsewhere, an assured monthly wage is the most important criterion for making the move – and they consider blue collar employment as the best suited to their temperament. However, wherever industrial development took place in coastal areas, local communities would appear to be most visible only in the construction stage – land-filling and other unskilled work.

While a few local people do find regular jobs, the overall contribution of new industries to local livelihood generation remains quite small. The increasing mechanisation and computerisation of processes reduces manpower requirements, it also calls for people with specialist skills and knowledge, something that people in fishing communities rarely possess.

Other activities where the fishers find opportunities to work include: construction of buildings and roads; financing (within and outside fishing), coir-rope manufacture (a traditional activity in Kerala that is still an important livelihood source for the women), transport (a gradual progression here, from loading seafood into trucks, to acquiring new skills and serving as drivers, cleaners or helpers), running catering services and local eateries, illicit liquor brewing and sale (has declined in the recent past), real estate brokering (especially in villages near major towns, which are growing very fast), salt pan labour (in Andhra Pradesh) and cottage activities like tailoring, stitching and embroidery (the most ubiquitous outcome of decades of 'alternative income generation' programmes).

But the widest range of livelihoods is adopted by the young. Literacy has steadily grown in many villages. Literate youth are not inclined to take up fishing because of the hard work it entails, the poor and uncertain returns it yields, and the social stigma that attaches to it. Opportunities beyond fishing are attractive: skilled trades like plumbing, electrical wiring and repairs, computer/IT related jobs, telecommunications (running telephone kiosks), operating auto-rickshaws and working as assistants in commercial establishments. A few have managed to land government jobs, becoming teachers and health workers.

Non-local options outside fisheries

The migration of many fishers from the Coromandel Coast to Singapore and other Southeast Asian countries to work in shipyards and related activities is an example of this kind. These fishers spend three or four years in Southeast Asia and return to their villages, with sufficient earnings to keep them going for some time. Most of them build good big houses in their villages, while some of them buy boats or set up commercial establishments in neighbouring towns. They spend a few months or even years in their villages and take off again for another trip lasting 3-4 years, entrusting the responsibility of looking after their assets to their kith and kin.

The migration of Andhra fishers to work in saw-mills in Gujarat is a case of push factors being stronger than pull factors, since the fishers do not really like their work, but are forced to endure it for lack of alternatives.

Case study: Sawmill labourers in Gujarat

Places like Gandhidham, Ahmedabad and Jamnagar in Gujarat house hundreds of wood-cutting industries, each employing 8-10 labourers. Nearly three-quarters of the labourers in these mills are reported to be from AP and predominantly from the fishing community. The mill owners hand over their mills to agents, who run them with contract labour.

Fishers from Andhra Pradesh are considered good as labourers because they are cheap and willing to work long hours. The recruitment is done by agents who approach workers in their villages. The role of the owners is confined to importing wood from other countries and distributing it to different saw mills under their control. The agents take up the work on a contract basis and set their workers to do the job.

The work is quite demanding. The labourers work from 8 a.m. to 9 p.m. Wages are based on turnover, and are paid weekly/fortnightly by the agent. No work, no wage — even if a labourer suffers from a work-related ailment or problem. Women are excluded from this activity, but about a tenth of the workers take their families to Gujarat to prepare food for them. Living conditions are bad, the quality of life for the family as a whole is dismal. Poor health, lack of schooling for the children, lack of employment security, social security and life security do create the right conditions for future deprivation.

Sometimes, fishers draw on their indigenous skills to develop a new trade. Example: the hammock trade in Andhra Pradesh.

Manufacture and sale of hammocks

Many fishing households in northern Andhra Pradesh have shifted their primary occupation to the manufacture of cradles and hammocks. Net-making is an age-old practice among fishing communities, but it has increasingly fallen into disuse after synthetic webbing entered the markets in the 1970s.

Making cradles and hammocks is a matter of putting the same skills to a more innovative use. One member each from a household takes products for sale to towns and cities within and outside the state. The large demand for hammocks drew many families into the activity. Nowadays, women take the responsibility of making the cradles and hammocks, helped by other family members including children and aged people, while the men take care of marketing, travelling from town to town.

To set up the right production and marketing systems to cope with the demands of the new activity, the fishers drew on the organisation of weaving activities in their neighbourhood and replicated similar mechanisms. Large-scale traders would distribute yarn to a number of neighbouring families and pay them according to the number of hammocks made. This division of capital and labour may have helped a few more than the others, but it also meant that people with no investment could still get work.

There are a few activities where the professional skills of fishers stand them in good stead and offer them good opportunities. Working in ports is one of these. The fishers' talents are often required in the operations. Migrant fishers from different states make up a bulk of the workers in major ports such as Mumbai, Veraval, Kochi, Visakhapatnam and Kolkata. The other livelihood activity which suits fishers is as merchant seamen: many thousands of fishers from northern coastal Andhra Pradesh work as sailors in the merchant navy.

Wooden boatbuilders of Andhra Pradesh, who suffered from the decline in boat construction in their native state, moved to Gujarat in the 1970s and 1980s to take up a range of carpentry-related jobs. They earned recognition as master carpenters locally, and fishers in Gujarat used their services to construct boats. These boats were eventually operated by migrant fishers from Andhra Pradesh. This meant that the carpenters had come a full circle, albeit in a different geographical context!

Even while working as unskilled labourers, fishers still manage to find small niches, where their capacity for hard work is put to the best use — e.g. as rickshaw pullers and construction workers. Here the strategy is to capitalise on their one major asset – capacity for hard work – which requires no investment. So they have nothing to lose except the opportunity cost.

Their adaptability and flexibility are reflected in the way their services would come to be looked upon as indispensable in many of the areas they would migrate to. Thus, in spite of their notorious disinterest in shifting out of fishing, men in fishing communities do undertake a range of activities when they are outside their immediate milieu or where they can be self-effacing (for instance, in urban areas).

In such environments, there seems to be virtually no activity that fishers see as beneath their dignity. Wage labourers in Veraval port. Waiters in hotels in Kolkata. Scavengers in north-eastern states. They seem to take on any role, accept anything that pays them a good wage.

Chapter 5: Factors contributing to LED Choices in the Post-Modernisation Phase

The previous chapters have provided a broad overview of the livelihood enhancement and diversification strategies adopted by fishers in different stages of evolution of fisheries. We'll now attempt to identify the broad themes emerging from the foregoing analysis using the Sustainable Livelihoods framework.

This will enable us to understand how different components of the framework provide appropriate choices for fishers in different phases. This will be followed by a summary of issues and responses in the post-modernisation phase, to determine specific factors that influence the fishers' choices.

Livelihood Choices of Fishers

An analysis of the livelihood choices of the fishers shows that four basic components influence the strength and resilience of livelihoods in fisheries.

i. The sector offers people a wide range of opportunities for developing suitable livelihood options.

ii. People have access to a range of assets which they develop, improve or modify to make the best use of opportunities.

iii. The capacity of the sector to sustain livelihoods is constrained by vulnerability – reflected in seasonality, the effect of natural and other shocks, and long-term trends. All these influence the sustainability of livelihood options.

iv. A range of policies, institutions and processes plays a critical role in determining the strength of each of the three components mentioned above, and their interrelationships. ("Institutions" here refer to physical structures as well as norms.)

Together, these four components constitute the 'livelihood context', which gives rise to certain livelihood choices – fishing, fish processing, trade, ancillary activities. These choices in turn lead to certain livelihood outcomes (steady employment, good income, enhanced quality of life, and reduced risk). Obviously, the effectiveness of these choices varies from individual to individual, group to group, place to place.

The opportunities in fisheries are dynamic and constantly changing. How sustainable livelihoods depends on how flexible people are in tapping opportunities and in coping with the vulnerability factor in their livelihood systems. When people shift from one livelihood activity to another (in a different sector), they will need to reorient their asset base – draw on a different set of assets or build new ones. This depends on the extent of variance between the two and the factors that supports or limit the shift.

The interrelationships between the four components listed above form the basis of the strategies for livelihood enhancement and diversification within and beyond fisheries. So let us summarise their key characteristics.

Strengths of marine fisheries in livelihood terms

We must comprehend the strengths of the fisheries sector, not only to make out how viable its livelihoods are, but also to assess how fisheries compares with other sectors in its capacity for livelihood support.

The strengths of the marine fisheries sector, from the livelihoods standpoint:

- Source of *food and nutrition*. Contributes to *economic growth*. Provides a wide range of *livelihood opportunities*, especially to the poor.
- *Multiple and renewable resources*-offering security of employment.
- *Diversity of options*: (A wide range of coastal resources requiring a wide range of adaptations, specialisations, skills and technologies. Several opportunities for livelihood support. Assured niches to the poor.)
- *Good market demand* and strong exchange value
- *Open-access* nature of resources. Offers ready entry to the poor;
- *Informal organisation of activities* supporting entry and survival of the poor.

- *Need for specific physical tools and skills* as a precondition to tap the resources. Acts as a deterrent against competition.
- *Flexible investment needs* allowing entry to the poor. Prompt incomes which facilitate *quick turnovers.*
- *Global linkages* and supportive national policy framework.
- Promise of *upward mobility in social and economic terms*

Weaknesses of marine fisheries in livelihood terms

- *Uncertain terms of access to resources, technology, investment and markets,* especially for the poor
- *Competition and declining returns* as a result of open access at sea and on shore; Open access is an asset in so far as it provides opportunities for entry to the poor. But it is a threat for ensuring secure access.
- *Fragility* of the coastal resource base; any upset to the delicate balance between the different components of the ecosystem could hurt the resource base
- *Perishability* of the product. This infuses urgency into sales transactions, increases dependence on intermediaries.
- *Uncertain incomes* – in terms of fish catches, sharing patterns and market values.
- *Irregular work opportunities and working conditions* – determined by the conditions of the sea and availability of resources.
- *Long market chains* – lack of control, role of intermediaries and competition.
- *High investment needs* and attendant risks, including chronic indebtedness.
- *Harsh and difficult working conditions* (low 'comfort factor'),
- *Long-term trends* such as 'fish famines', resource declines, pollution, economic events, national and global.
- *Seasonality* which makes people unemployed for parts of the year.
- *Shocks* such as cyclones, erosion, floods and – of late – tsunamis, which affect the asset base of fishers, often seriously.
- Conditions of growth focused on *specific species, intensive and costly* technologies and *long market chains*

Asset base of fishers

The key assets of fishers with an important livelihood dimension:

- *Physical proximity* and access to a *diversity of natural assets*, more than for other coastal dwellers (who lack access to sea);
- Inherent *skills, knowledge, aptitude and ability* related to fishing and relevant disciplines (navigation, oceanography, marine biology); physical unskilled labour is the main asset outside fishing;
- *Household - based livelihoods* to reduce risk-more of household based livelihood systems than individual based system;
- *Aptitude for & history of livelihood diversification,* but primary allegiance remains with fisheries. It also includes seasonal or regular migration as an important livelihood mechanism;
- *Freedom and independence in decision-making* as a prerequisite for several activities;
- Access to indigenous and low-cost *physical tools and technologies* to tap the natural resources;
- *Support networks* at the community level;
- *Flexibility and adaptability* in choice and organisation of livelihood activities, largely an outcome of the conditions imposed by the sector;
- *Short turnover cycles.*

Transforming structures and processes in the fisheries sector

The key policies, institutions and processes influencing the processes of change, their causes and consequences in the sector, are:

- *Caste and kinship relations* and their influence on 'social capital'
- Formal and informal *governance mechanisms and policies* for ensuring/regulating access to resources and coping with vulnerability
- *Government* as a source of economic support
- *Gender-based division of labour* to optimise opportunities and reduce risk
- *Markets* which are integral to the existence of the sector
- *Macro-economic and global policy context*, e.g., emphasis on exports, subsidies, management, liberalisation, globalisation, sectoral allocations. These open up new opportunities but also impact on sustainability and equity.
- Role of *private sector* in livelihood support including risk sharing[46]

Livelihood context in the three phases of fisheries development

A person or a group undertakes a LED-strategy for one of three reasons – to protect the current position; to move up the value chain; or to cope with change by taking a step backwards.

The first reason, aimed at conserving the status quo, defines ***'conservative strategies'***[47]. The second, which makes people upwardly mobile and seeks to improve their competitiveness and maximise their returns, defines ***'competitive strategies'***. The last, involving some turnaround or stepping back from the current position, comes under ***'coping strategies'***.

In a dynamic sector like fisheries, these three sets of strategies – aiming respectively at staying put at one position, moving upwards and moving downwards – must exist simultaneously in all three phases of fisheries development. But an analysis of the livelihood context in the three phases shows that the motivation behind each phase was different.

i. Pre-modernisation

In the pre-modernisation phase, the sector could provide no more than subsistence incomes. The sector was delicately poised between opportunities and vulnerability

Existing technologies could not maximise yields from natural resources, new technologies were not possible because investments were lacking, and market demand to stimulate such investments was weak. Fishers could not cope with vulnerability (especially seasonality) with existing livelihood options; they were compelled to seek alternatives. These included long-term occupational options (both local and non-local) and seasonal geographical options.

LED strategies in this phase were necessarily *conservative*. They aimed at conserving access to resources and ensuring equity in distributing benefits across the communities. Labour and social networks were the assets that the fishers could draw upon. The human assets – knowledge, skills, hard work – provided the motor for fishing and post-harvest activities. Social organisation formed the foundation for the economic basis of the sector.

Risk reduction was an important conservation strategy. Adaptations like kinship and gender-based development of activities, together with the local origins of technology, reduced the need for investments and recurring costs. Migration was made possible by pioneer communities who had migrated earlier, by forging new bonds among themselves and with local communities, and by being flexible and adaptable with opportunities.

In the pre-modernisation phase, the transforming structures and processes that helped fishers were: caste, the glue that held the communities together while keeping outsiders at bay; gender roles, which

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[46] *Like 'globalisation', the concept of PPP (public-private partnerships) has been a fact of life in fisheries long before the idea entered public domain.*

[47] *'Conservative' in the sense of conserving what is and building upon it, rather than in the sense of being anti-progressive and closed-minded.*

gave women an important economic function; and traditional governance systems which evolved intricate mechanisms for ensuring sustainable resource access and equitable distribution of benefits among their members. The growth of plantation economies as well as improved transport facilities encouraged the process of migration to Sri Lanka, Malaya andBurma and within the country.

ii. Modernisation

In the modernisation phase, there was a manifold increase in opportunities for livelihood support, but the extent of vulnerability remained the same.

Market demand and government support allowed entry of investments and more efficient technologies into the sector. Natural resources responded favourably to increased levels of exploitation. The additional income generated from the sector added to the risk-bearing capacity of people and helped them to become more *competitive*.

The conservative organisation of fishing was not conducive for capital-intensive commercial operations. Social assets may have become weaker during this period. Strategies for enhancement and diversification undertaken during this period were driven by a desire to maximise returns rather than cope with seasonality, or any other vulnerability factor.

The government played an all-important role in the process of modernisation. The growth of export and urban markets strengthened the private sector. The role of women weakened. Caste-based and community-based governance systems served as intermediaries between the communities and the external world.

iii. Post-modernisation

The post-modernisation phase is marked by crises. Opportunities have come down, vulnerability has gone up. There is uncertainty in access to the raw material – i.e. fish. This has been made worse by reduced access to investments — a result of global trade fluctuations, mounting operational costs, weakening government support. Result: the economic viability of the sector in the last decade has fallen. The following table summaries issues in the post-modernisation phase (Chapter 2).

Changes (trends)	Causes	Consequences
Reduced access to fish	• Open access • Destructive fishing • Overfishing • Competition • Focused fishing on certain species • Access limited due to inability to invest in the right technology	• Fewer fish catches • Conflicts • Competition • Mounting investment needs • Indebtedness • Marginalisation from harvesting sphere • Reduced income • Migration to other activities and areas
Mounting investment and recurring cost requirements	• Investment needs for obtaining/ replacing technology • Operational costs • Maintenance • High cost of credit • Debt servicing • Lifting/reduction of subsidies • Global trade demands	• Idle capacity • Unviable operations • Indebtedness • Inability to repay loans with existing income sources • Ownership concentrating in fewer hands • Distress sales • High indebtedness • Reduced income
Changing trade context	• International fluctuations • Global trade measures • Competition at the landing centres • Trade access limited due to poor investment capacity • Too many intermediaries • Competition at the markets	• Reduced margins of trade • Reduced affordability of fish to traders and consumers • Reduced access to markets • Marginalisation in the traditional fish supply chains, especially for women

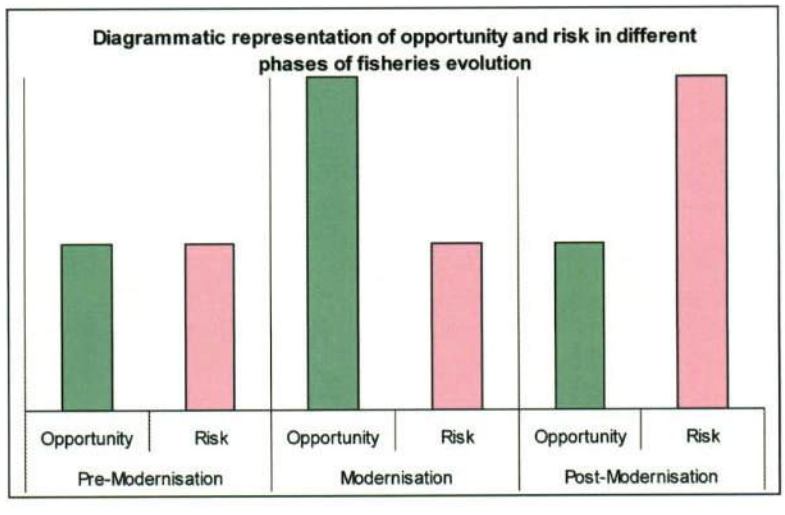
The trends discussed above reflect the sector's inability to provide for sustainable livelihoods, also its inability to help people cope with cyclones, with the December 2004 tsunami, with seasonal deprivation.

The responses of fishers in the post-modernisation phase drew on the same sets of assets as before. But these were reoriented to suit a different livelihood context. Thus, social capital resurfaced in the fisheries sector. As before, it is a mechanism to spread costs and reduce risks. But there is a subtle difference. Earlier, community structures determined individual action. Now it is the individual players who set the scope and limits to collective action. Whether a group of fishers decide to operate a number of boats jointly, whether fisherwomen procure and transport fish together, the impetus for sharing comes at the individual level. Social action is now as much a business decision as, say, investing in a new boat.

Likewise, strong market demand triggers investments into the sector through credit. For fishers, credit is needed not so much to invest and maximise returns (as was the case during modernisation) as to somehow survive in the sector. A majority of production-related loans merely meet daily operational costs. The returns are sufficient for survival and enable risk reduction – a kind of return to subsistence economy.

The transforming structures and processes in the post-modernisation phase have been: good market demand, and new economic opportunities that the macro-economic policy context made possible. The role of government was important at two levels: as a guardian of the resources and as a provider of subsidies.

The graph below gives an idea of the varying levels of opportunities and vulnerabilities in different phases of fisheries development.



Factors contributing to LED choices

As we have seen in foregoing chapters, the fishers' choice of a livelihood strategy is not a random act, but is the outcome of a process (often latent rather than patent) of weighing their options in the light of various considerations. This section aims to unravel the factors behind the fishers' choices for livelihood enhancement and diversification.

The choices concerning livelihood enhancement are relatively straightforward. Those relating to livelihood diversification require a study of the relative influence of push-and-pull factors. Not all the factors determine any single strategy. But this list is behind a majority of livelihood choices we have encountered so far.

The factors summarised here derive from three sources. First, from an analysis of fishers' choices. Second, from secondary data on the subject. Finally, from interactions with individuals who know the sector. After synthesising them into a Sustainable Livelihoods Framework, these factors were presented at a few meetings with fishers in Andhra Pradesh – men and women – for validating the results. There was no time for similar exercises in other states.

Livelihood outcomes

***Income*:** The opportunity to earn regular income is the most important motivation for undertaking LED strategies. Most fishers would prefer a wage-paying job to a share-earning job, the latter being the characteristic of many fishing operations. Higher income is less important than steady income.

Source of employment is an important consideration. Working in the primary sector or in 'traditional' occupations like agriculture is considered a compulsion rather than a choice. Secondary sector occupations – such as those of blue-collar workers in 'factories' – are regarded highly. But traditional secondary sector occupations like house construction are not preferred much — except when its returns are very good or the fishing conditions too bad. Tertiary sector occupations are preferred by the young. Working for the government is considered to be absolutely the best choice – in terms of both prestige and retirement benefits.

***Comfort factor and other quality-of-life considerations*:** The next important consideration in choosing a livelihood activity is the 'comfort factor' and quality of life. Fishing and the fish trade require hard work. Fishers long for a way to reduce their drudgery – something ignored in all the discussions about their attitudes to new technologies. The comfort factor is the most important reason for fishers switching to FRP boats. A healthy working environment is a closely related factor — e.g. the shift from the fish trade to shrimp processing by women, and from fishing to fish trade by men. Enhanced quality of life is another consideration. Example: families shifting from rural areas to neighbouring urban areas.

***Freedom of choice*:** Working in fisheries – especially at sea – requires a degree of freedom and independence in decision-making. Rank or privilege is immaterial at sea: a boat owner is just another crew member. This factor may have been eroded to some extent in the modernisation phase, but evidence of independence and freedom is still very visible in the structure, organisation and functioning of the sector. It is one of important reason for the unwillingness of fishers to move out into alternative occupations, even if that means going back to basics or working for less wages. Freedom comes from two other sources: being with one's own people and in one's own environment and from the ability to 'enjoy' life as one deems fit. The conditions in fishing communities allow both.

Social and economic mobility: In many diversification processes, one important push factor has been the need to escape social oppression and economic pressure in local societies. The migration of people from the east coast of India to Malaya and Burma was strongly influenced by economic need, but even more importantly, to escape the hierarchical caste system and its hold on the choices of people.

Conversely, the shift to a new activity is also an opportunity for upward social and economic mobility: the shift from non-motorised to motorised boats automatically enhanced the social status of fishers. The switch to a job on a mechanised boat made many young men eligible grooms.

Apart from such instant social upgrades, economic upward mobility is frequently achieved as the *outcome* of migration, as happened with Gulf migrants in Kerala. Even where there is no discernible social or economic upward shift in the immediate future, certain choices promise such a possibility. An important example is that of youth in many fishing communities signing up to work as cooks and helpers onboard mechanised boats (for hook-and-line fishing in Thoothoor in Kanyakumari; for trawling in Gujarat).The youth saw this as a period of apprenticeship in the hope of becoming a captain in due course.

Livelihood strategies

***Sustainability*:** Since uncertainty in access to resources drives many people to seek alternatives, a new livelihood strategy would strive to ensure (i) sustainability of employment opportunities, (ii) sustainability of tenure to the assets that the activity requires (raw material, technology, investment, manpower and markets) and (iii) sustainable availability of these assets over time. Curiously, considerations such as this seem to apply largely to new activities that the fishers move into. For example, a shift to agriculture as considered unviable because there is a market-related crisis there. Given the central role that the sea and the fish within it play in the daily lives of people from birth to death, it may be difficult to rationalise the relationship to apply such considerations in a clinical manner.

Local availability of resources, technology and markets: Local availability of resources enables fishers to overcome logistical difficulties and costs of transport, also lets fishers confidently assess the viability of the activity in terms of livelihood support. The Ganjam fisherwomen who built a mosaic of livelihoods based on a range of locally available assets, and worked profitably round the year, offer a good example.

Technology that's locally available is usually economically viable and ecologically appropriate. Management and maintainence may not be a problem.

Demand for local services helps local people to draw on their knowledge, social networks and skills and tailor their trades to suit local fisheries needs. Textile traders, for instance, tailor their production and marketing to suit local fishing realities. (They provide credit, don't apply pressure for repayment during lean fishing periods.) Likewise, basket-weavers develop a range of tools that are fisheries-centred. These products are in demand round the year. ***Opportunities for diversification:*** As we have seen, the most widespread option for enhancing livelihoods is to diversify the asset base of fishers, their market strategies or even livelihood strategies, in such a way that new activities supplement existing activities.

Household-based activities: Fisher households are switching focus from individual earnings to household-based earnings. The men fish, the women seek out tasks and jobs within and outside fishing. Thus, any activity that enables the household (rather than individuals) to diversify finds better acceptance.

Optimising operations: Fishing and fish-related activities can be carried on at almost any level with almost any kind of investment. This affords fishers the flexibility to move upwards, downwards or sidewards (i.e., into related activities), This allows them to survive within the sector. Even if they stay put in the same activity, they can carry out adaptations to cut costs or losses and maximise earnings.

New activities as secondary activities: Where individuals (not households) undertake diversification, the new activities would remain seasonal/secondary preferences unless their traditional activities become totally inaccessible or the new activities are very lucrative. Fishers' choice is for a new activity that can pursued as a secondary option while they carry on with fisheries. .

***Non-competitive activities*:** For a poor household the sustainability of whose livelihoods have been hurt by competition, entering into another activity which means competing with other groups of people, is not an option at all.

***Informal organisation of activities*:** Efforts that seek to formalise production, processing or trade activities in fisheries may mean well, their aim is better economies of scale and better returns. But they can as well threaten poor stakeholders whose livelihoods depend on the informal nature of fisheries. Formalisation could impose alien ideas and concepts that local people simply can't relate to. Formalisation may also straitjacket people into specific channels and takes away the freedom of action that most activities in fisheries thrive upon.

The following sections discuss the choices of the fishers according to specific assets which have a bearing on their livelihood strategies:

Natural assets

Assured terms of access to resources: Fish and most other resources that the fishers take for granted have either been open access or common property. This is reflected in the way the sector itself has come to be organised (few households, for instance, hold proper documentation on their homestead land). Common property arrangements are regarded as the best option to ensure affordable terms of access to the resource and assured tenure. Other options, such as private property, are not accessible or affordable to the poor, they require capital.

As experience shows, even if access to such resources gets subsidised, the poor would still not be able to afford the working capital. Shift to secondary/tertiary sectors is undertaken for more steady incomes, social status and economic mobility — mainly by people in the communities who are relatively better off.

Seasonality is a major constraint that regularly hounds fishers. Any option that shows them a way to avoid or overcome the effects of seasonality is much valued.

Perishability of fish is another factor that makes fishers vulnerable in many ways. It is a factor in their choice of a shift. It could be to commodities which last some time without any post-harvest care (for instance, vegetables), to commodities that last long (for e.g., rice, textiles). The preference obviously is linked to market demand (fish enjoys bigger demand than rice, which in turn is more in demand than clothes). But given an option, the longer-lasting commodity is preferred for trade.

Opportunity to diversify to a wider resource base: One of the lessons learned from the shrimp experience that focusing on one species or a small range of species to earn a major proportion of your income is risky. It makes sense for many fishers to earn their basic income from a range of species, while using the returns from shrimp and other high-value species as the surplus. Opportunities to exploit a new/unexploited resource or niche are always welcome. These are linked to boom-and-bust strategies, but access to such opportunities is seldom easy for the poor.

Acceptability of alternative choices to the target group: Most primary sector occupations are caste-based or have some kind of social connotation that does not allow "other" people to move into them, even if they look more lucrative or sustainable. For many coastal fishers, working in agriculture or rearing pigs are unacceptable options. Goat or cattle-rearing requires skills that they don't have. Hen-keeping is widespread in a coastal village, but it is seldom for commercial purposes (although it is now taking root in some areas like Killai). Experiments with growing exotic varieties of hens, goats or cattle[48] in coastal areas have proved unviable – either because the animals could not survive in the new conditions or because they were denied proper care by fishers in their ignorance.

Physical assets

Cost-reducing strategies for owning and operating technologies: Given that the cost of technology and its operations has a major impact on profitability[49], most livelihood enhancement strategies focus on lesser technologies (like new plank-built boats in Andhra Pradesh or diesel-powered engines in Kerala), which cost less to own and operate[50]. The adaptations made in the operations of several post-tsunami FRP boats also indicate a range of technical and non-technical adaptations to minimise costs and risks. Local availability of technology and its support infrastructure (spare parts, servicing and maintenance facilities) also determines the extent of its uptake.

Increased efficiency: The other consideration in the choice of a technology is increased efficiency. To the extent that increased efficiency of a superior technology can offset the financial risks it entails, there is evidence that people are investing in it. The spread of ringseines and stainless steel trawlers along the Tamil Nadu and Kerala coasts indicate that the returns from such fishing systems more than compensate for the additional investment they demand. In several cases, the investments in costly technologies are made assuming very high rates of return – a stainless steel trawler is supposed to recover its investment in three years – and this requires undertaking intensive operations overlooking their destructive impacts upon already depleted resources.

Other considerations for a choice of physical asset include:

1. Availability of external support – subsidies and credit.
2. Adaptability of the new technology to the local context – both ecological and economic.
3. Existence of forward and backward linkages (markets, infrastructure, transport, electricity, facilities for maintenance, repair and replacement, supply chain linkages – traders and credit, post-harvest facilities such as ice) for successful adoption and utilisation of a technology.
4. Comfort factor.
5. Increased social status as a result of ownership of a particular technology.

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[48] *See Sainath (1996). He provides a case study from inland areas of Orissa, illustrating how implanting a new species into an alien ecological and economic context could marginalise the poor even more. In the post-tsunami context, goats provided as part of alternative livelihood support were sold off within days of being given to the fishers (in Killai area). Chicken provided elsewhere under similar programmes eare reported to have died shortly afterwards (for e.g., Sinna Mudaliar Savidi).*

[49] *In many cases, costs of operation are considered to have a serious impact on operations — even more than the non-availability of fish.*

[50] *A striking fact about the widespread demand for FRP boats all along the coast after the tsunami. The factors that govern this choice are quite different from those made by fishers at other times: as evidence, one can compare the numbers of new FRP and mechanised boats built in the two years before the tsunami (when there was little external support for them) and a corresponding period since.*

Human assets

Building upon strengths: Human assets – knowledge, skills and the unique strengths that working for generations in a particular sector bestows upon people – are the most important asset for the poor in any sector. It is especially so for a specialist occupation like fishing. This specialisation can also constrain fishers' capacity to diversify. They have confidence in their own activities and lack such confidence in other activities. So they tend to favour activities in which conditions closely parallel those in fisheries and allow fishers to build on their strengths. This explains the fishers' choice of fishing as their 'first option, second option, and the one-hundredth option' (to quote a fisherman in Chengalpet district).

Developing niches: The fishers do choose options outside fishing where conditions do not always parallel those in the sector, but there seems to be a pattern to such choices. For instance, they seem to seek small, non-competitive, niches, where their basic skills have a role to play: the employment of large numbers of fishers in port operations or river transport or as sailors in merchant navy vessels is a choice based on their own skills.

Examples are ancillary-worker occupations such as those of boat makers, rope makers, hammock-and cradle-makers and basket weavers. Here, fishers adapt their basic skills to cater to a wider or a new clientele. These niches also reflect demand for their skills. Fisher girls from Kerala were in demand for work in processing factories. Andhra Pradesh fishers were in demand for work on trawl boats.

Labour-intensive activities: Activities which are labour-intensive, where manual labour cannot be easily replaced with mechanical labour – as in the case of making incense sticks or beedis — seem to attract people in fisheries more easily.

Self-esteem: Often, people don't seem to mind working for less if the new activity enhances their social status. Working as industrial labourers is seen by many as an important step up the ladder. Andhra Pradesh fishers at work on trawlers in Gujarat on very low salaries – this practice too is status-linked. This is why many fishers disdain working in agriculture or as construction labourers because these are not considered dignified.

Inter-generational differences in attitudes related to diversification: The younger generation in fishing communities is far more ready and willing to move out than the older. In fact, older people fear the day when none of their descendents will be involved in fishing.

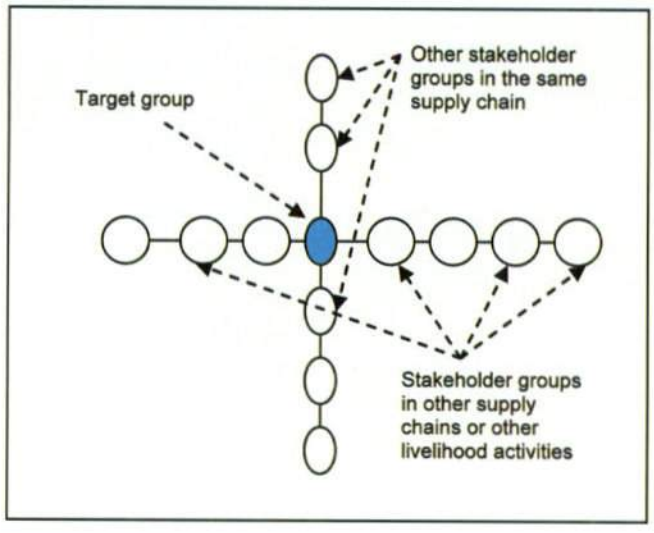
Social assets

Building on social capital: An important consideration in the choice of a new LED strategy is the extent of social support it can draw upon. Caste and kinship ties play a crucial role in determining a choice in order to ensure social security and avoid social opprobrium. Increasingly, group-based activities are preferred over individual ones in order to reduce risks. Conversely, the extent to which an activity conforms to the norms and the value systems in a society determines its acceptability levels.

Existence of social networks and pioneer groups to facilitate shifts to new activities: "The place I am gong to, are other fishers from my village there"? This is a question fishers ask themselves. The presence of social networks and pioneer groups in the locations that fishers diversify to is a prerequisite for the process to take root. Local social networks help fish traders to get their fish. It enables sellers of non-fishing commodities (like textiles) to sell their merchandise. Well-settled pioneer communities acts as a magnet for more people to seek opportunities there, with active support from the pioneer groups. The security of migrating and working together with a number of people from their own communities helps fishers to make the shifts confidently.

Connectedness: In a sector characterised by connectedness among poorer stakeholders – vertical (linkages between successive stages in a supply chain) and horizontal (linkages between stakeholders in different supply chains), fishers are usually prudent about undertaking a new activity – enhancement or diversification – that upsets existing linkages between people, livelihoods, activities and outcomes.

While boom-and-bust activities and the spread of ringseines do cause major upsets in the system, they do not disturb the fundamental 'connectedness' of people, particularly the poor. This is borne out by the way the networks reappear as soon as the boom-and-bust technologies withered away.



Maintaining gender roles: Several activities that people move into manage to preserve gender roles: some activities – agricultural labour, petty trade within and outside the villages – remain firmly with women, while men's activities relate mostly to fishing or hard manual labour.

Financial assets

Improving financial base: Falling incomes and growing indebtedness are important push factors for undertaking migration. In almost all migratory paths involving mass migration, the offer of lump sum cash advances[51], the possibility of returning with another lump sum to take care of accumulated debts and major expenses (weddings, house repairs/construction) and the opportunity to save the living costs of migrants in the household economy are major considerations. Examples of such migration: fishers going to Malaya in the 19th century, to Gujarat in the 20th century, and girls from Kerala going to different states for shrimp processing,

While the migration to Gulf countries is not backed by cash advances – if anything, it requires sizeable investments for tickets and other formalities – it holds out the prospect of making a little fortune, and that is a major pull factor.

Low investment needs: Generally, poorer stakeholders avoid any activity that requires an investment. Even when the investment is subsidised by some means or the other, the need for regular working capital puts them off the activity. This is linked to their inability to maintain records of incomes and expenditures and work out how profitable their operations are. Where they do make investments, they take care to enter into activities where the investment needs are within their means and also flexible.

The fish trade, for example, is an activity where even the poorest person can get into with little investment – or even no investment, if she manages to obtain fish on credit from the boats – and naturally it is into fish trade that most poorer people would invariably drift. The terms of trade remain an important consideration when people move into new activities: cash-down transactions are the least preferred, part-payment is acceptable but deferred payment arrangements (where the buyer sells his/her product first before paying the first seller) is the most preferred.

Short turnovers are an intrinsic to marine fishing activities. For many poorer people, ready income is almost as important as steady income (the two frequently being more important than higher income). Their normal livelihood activities being based on daily turnovers, fishers would prefer to be handed their wage at the end of the day. This is said to be a reason for women in many areas choosing to work in agriculture.

In most trade-related activities, it is the norm to use the returns from one cycle to finance the next. This explains traders' willingness to sell dried fish even for a loss once they take it to the markets, rather than

[51] *Advances can be considered as an important institution in the sector in so far as the relations between the traders and the boat owners and between the boat owners and the crew are mediated by the system of advances.*

bring it back unsold — because that would hold up their next cycle of operations. The need for short turnovers also explains the unwillingness of fishers to shift to activities like aquaculture on a full-time basis: they feel more comfortable with quicker returns.

Existence of systems/processes/subsidies to externalise part/whole cost of operations: As we have seen, one of the most important functions of social governance systems was to enable fishers to externalise a part of their costs. This kept them in business. The strategies of modernisation included subsidies in a big way. These helped the sector to maximise returns by reducing capital investments and recurring costs. Infrastructure development in coastal areas was possible only because of government investments.

The much-discussed 'subsidy culture' among fishers evolved from the way 'development' in the sector was achieved by recourse to subsidies at every turn (including support to co-operatives which ended up being a channel for routing subsidies into the sector). Apart from such historical dependence on subsidies, many poorer people in fisheries clearly need to draw on a range of systems, processes and subsidies to meet investment needs sustainably and survive. Some of these systems are implicit, hence less easy to recognise and more difficult to cope with when withdrawn.

Access to credit: Access to credit is another important consideration in the choice of an activity. Activities within fisheries are currently more credit-worthy than in any other sector. This effectively limits fishers' choices for diversification to activities within fishing. Alternatively, the choices they make are limited to those that don't require any investment – such as wage-based employment.

Policies, institutions and processes

Markets are the most important institution in the fisheries sector. Steady market demand is an important factor in choosing a new activity; access to markets is influenced by a range of factors other than simple availability of raw material. The poorer stakeholders prefer small local markets and small margins (because larger margins mean entry of more powerful players into the trade). While they do not shirk from taking advantage of new/diversified market opportunities, they must assess these opportunities against several concerns, the most important of which is preserving their existing livelihood base.

In fact, for many stakeholders in fisheries, markets are a viable option only for the fish trade. All other market activities – new products, new market channels – invariably entail competition with other (better established) groups, and the fishers do not feel confident about it. Many people who pursue market-based enterprises would be happier to work as daily wage earners rather than as shareholders, in order to reduce risks. Having dealt with uncertain supplies (availability of fish) and uncertain returns (which are a characteristic of any trade) all their lives, many people would prefer shifting to a steady wage-based employment even if that pays less.

Institutional support: If an activity enjoys good institutional support systems – which provide consistent and meaningful access for the poor to investment, technology, skill development and markets – it will draw people. Positive discrimination policies – reservations for women, for the backward classes and for the physically challenged – are another draw, they may ensure sustainable livelihoods, and people may diversify into such an activity. On the other hand, a profusion of support programmes that do not clearly understand the community's needs, or focus on some aspects (technology transfer, training) while ignoring others (forward and backward linkages; investment and market support) will not be sustainable. Activities that follow blueprint approaches have bred cynicism about their usefulness.

Caste codes: Strong social mores based on caste (or similar institutions) may influence the choice of an LED option. It is the caste-based nature of fishing that assures fishers access to the sea and its wealth. It is not always possible for marginalised groups of people to overcome the influence of caste and take advantage of new opportunities. This means that new options must have a wider and deeper remit than an increase in earnings.

New opportunities: Other factors that determine livelihood choices are the new opportunities provided in an area by industrialisation or urbanisation; growing literacy in coastal communities; the prevailing (or changing) mores and attitudes at the societal level; and opportunities arising from the macro-economic or global context.

Assessing LED strategies in the post-modernisation phase

Vulnerability is conspicuous in the post-modernization phase, as discussed in previous chapters. Neither the pre-modernisation strategies of holding on to existing opportunities (or assets), nor the modernisation strategies of competing for a higher stake in the value chain, would be valid for a majority of people in the sector.

What they need are ***coping strategies***, which require adaptations, small-to-major changes to the overall livelihood context. Some strategies adopted during the post-modernisation phase are both inclusive (they continue those of previous phases), and oppositional (they are in conflict with strategies from previous phases).

The various enhancement and diversification strategies adopted indicate that the fishers' responses addressed vulnerability issues at three levels, often in combination:

- Those addressing the ***causes of a change***: i.e., addressing specific factors that engineered a change. For example, fishers use engines of weaker horse-power, or shift to cheaper fuels, or begin to depend on subsidies, to reduce the cost of fuel in fishing operations.
- Those addressing the ***change*** — the specific strategy that has been the subject of change. Example: fishers switching from motorised boats to non-motorised boats to reduce the cost of operations in fishing.
- Those addressing the ***consequences of the change***: i.e., addressing the specific livelihood outcomes of a change. Example: fishers diversifying from fishing to the fish trade or other activities in order to reduce risk with overcapitalised fishing operations.

The responses of the third kind – i.e. coping with consequences of change – take the form of seeking options outside the 'box' – i.e., outside the existing activities within and outside the fisheries sector. This helps us to see diversification strategies as not only continuing from, but being an integral part of an iterative process of building sustainable livelihoods.

The achievements of the various LED strategies in the post-modernisation period are considerable. The most important of these lies in overcoming the shrimp-driven export market fixation and developing a more robust market orientation. The diversification to other species may also have reduced the pressure on certain high- value species. But in a context where reporting procedures are extremely poor, it is difficult to say how effective this change has been in improving the health of natural resources.

The cost of operations too has been rationalised, although this is constrained by the weakening of support from the government and the private sector. The latter continued to remain shrimp-driven until very recently. Its emergence in a new format – to cater to urban and inter-state markets – comes with a change in the rules of game: for instance, there is not much emphasis on 'advances' in the system. This gives fishers the freedom to sell their product in the open market while reducing investment risks for trader-financiers.

Obviously, the process of change involved making compromises, facing hardships and (for some people) losing out completely. On the other hand, this may have helped improve the economic performance of the sector and its players and increased their resilience to future change. We shall be returning to these issues in Chapter 7.

Analysing the strengths and weaknesses of the choices

The following appear to be some of the strengths of the choices fishers made:

- ***Issue-specific***: The strategies are responses to specific issues confronting them. As the issues of concern evolve gradually, so do the people's responses, indicating a close fit between the two at any given time. This allows fishers to gain a proper understanding of the way issues are evolving, and helps them to make appropriate investments in an incremental manner, rather than being forced to do so at once.
- ***Building upon strengths***: The responses are built upon people's strengths. These give them command over the conditions, which they would otherwise not have. This allows them a lot of flexibility in controlling, modifying or reorienting their strategies according to the changing context.

- ***Addressing multiple concerns***: The responses are locally oriented. There is a variety of responses from one stakeholder group to another, from time to time and from place to place, and these manage to address multiple concerns simultaneously.
- ***Targeting multiple levels*:** Because an emerging concern has implications at different levels in the supply chain (vertical dimension) as well as on a range of other activities/players not directly involved in the supply chain (horizontal dimension), the responses tend to be at many levels and in many directions at once.
- ***Direct outcomes*:** The outcomes of these strategies are direct. A strategy either succeeds or fails, but the knowledge is available to fishers almost immediately, allowing them to make a different choice next time.

While recognising the strengths of the choices made by fishers, one should acknowledge that not all choices are uniformly good, either for the livelihoods of fishers or for the larger fisheries context. In fact, some of the responses militate against the factors summarised in foregoing section as contributing to the LED choices of fishers. Some of the concerns in this context would include:

- ***Reactive***: Several of the strategies take the form of random ***responses*** to an unfolding chain of events, rather than the outcomes of carefully thought out plans of action. Obviously, this is how things generally work out in practice. But since the problems in the sector are rather well-defined, one would expect more coherent responses for dealing with the issues at different levels.
- ***Inadequacy of responses*:** Several strategies are inadequate or inappropriate to cope with the problems that they confront. As we have seen, being locally oriented is an advantage; the disadvantage is that they tend to be local responses to a much larger problem. Their effectiveness in providing long-term solutions is limited.
- ***Inadequacy of institutional support*:** A major grey area is the inadequacy of formal policy mechanisms in addressing issues or supporting fishers' responses from a macro-level perspective.

But the more important concerns relate to sustainability and equity. The checklist below lists sustainability criteria relating to five dimensions – the environment, technology, economics, equity, institutions — for LED activities undertaken by fishers.

Sustainability dimension	Criteria for sustainability
Environment/ ecology	• Overall health of the natural resources • Appropriateness in meeting the market demand (local/non-local) • Availability of natural resources to different stakeholders over time, with increased demand and with improved efficiency of production systems • Terms of access to the poorer stakeholders in the supply chains (physical access as well as entitlement related)
Technology	• Availability • Appropriateness to (i) address the purpose and (ii) the local ecological and economic context • Quality (of construction) and adequacy of technology • Resilience to cope with the local context (ecological, usage-related) • Extent of understanding and control over the technology for the users • Affordability in terms of capital and working costs
Economics (investments and returns)	• Availability of investments to achieve economies of scale • Existence of backward and forward linkages • Appropriateness to the local livelihood context (nature of operations, seasonality issues) • Terms of trade for different stakeholders • Real incomes generated and distribution of benefits among different stakeholders
Social sustainability (including equity issues)	• Fit with the social context in terms of drawing on social capital and impact on it. • Equity implications of a strategy in terms of: affordability of access, usage and upkeep • Equity implications in terms of: direct/indirect implications of a strategy upon other stake holders (i.e. not directly involved in the supply chain)
Institutions	• Existence of strong and steady market demand and market linkages • Appropriateness of strategy in terms of coherence with overall policy and institutional framework • Capacity for self-regulation

Some components – for instance, relating to environmental sustainability – were not applicable for livelihood diversification activities such as migration. But the checklist has been useful in arriving at some broad conclusions of a 'quick-and-dirty' nature. From this, it is possible to see that different activities have different levels of sustainability for different dimensions. While it is not possible to present a comprehensive analysis here, it is possible to arrive at a broad categorisation of activities according to their sustainability-equity implications. A summary is as follows:

	Examples of LED Strategies	
	Livelihood enhancement strategies	**Livelihood diversification strategies**
1. Strategies with positive sustainability and equity implications	• Loss reduction • Diversification of fishing effort and local supply trade (but not urban/inter-state trade) • Optimising operations (many, but not all)	• Migration to Gulf and to Southeast Asian countries • Seasonal migration of Andhra Pradesh fishers to Orissa • Diversification of women in Orissa to a range of occupations
2. Strategies with positive sustainability implications but negative for equity	• Diversification of trade to urban/inter-state markets (especially Kerala trade on the east coast) • Protecting turfs at sea and on shore including self management measures • Technological innovations • Part-time operations	• Migration of fishers from Andhra Pradesh to Gujarat for fishing and other activities: sustainable activities, but the overall equity implications could be negative
3. Strategies with positive equity implications but negative sustainability indicators	• Dependence on subsidies and informal credit • Boom-and-bust opportunities	• Migration of fisherwomen from Kerala to other states for shrimp processing: positive equity implications locally, but doubts about sustainability of several processing operations reduces work opportunities
4. Strategies that are neither sustainable nor equitable: 'back to the wall' measures	• Slash-and-burn fishing[52]: for e.g., spread of ringseines on the east and west coasts, which has implications on sustainability and equity for the sector as a whole	• Shift to activities like shrimp-seed collection, liquor brewing, and mangrove felling – unsustainable and also criminalise people and reduce their access to social/institutional support even further.

A case for drawing upon institutional support in LED initiatives

The reason many LED strategies of fishers fail to meet the twin goals of sustainability and equity is clear. Conditions affecting the fishers' livelihood choices are not local, and require long-term, systemic and macro-level responses. In a sector where a large proportion of people lead a hand-to-mouth existence, it is nearly impossible for people to take a step backwards, assess their options, and undertake measures that would help them to improve the conditions in the long term[53]. Their control over, or capacity, to inform and influence fisheries policy and institutional mechanisms in fisheries including markets is very weak. This is particularly so with the poorer stakeholders.

Thus, even when some of their LED strategies have positive connotations, they fail to make an impact because of their inability to transcend the 'local' and get into the larger policy realm.

On the other hand, the failure of the larger policy-institutional framework to understand the local context and develop meaningful responses to deal with it means that even potentially sustainable LED responses fail to get the support they require. This forces people into 'back-to-the wall' positions, and encourages them to take up desperate measures like destructive fishing practices. It is not that they do not know the

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[52] *Trawling has serious sustainability implications and negative equity implications for other fishing systems at sea, but positive implications on the shore. As artisanal operations become specialised, their ability to support poorer groups in trade and processing declines, and trawling remains a consistent source of fish for such people.*

[53] *Which is a bit like expecting a starving man to start a strict diet control programme so that he could enjoy a big meal at some indefinite future date, with all the food he has saved by not eating it now!*

implications of what they are doing; they do, and better than anybody too[54], but they simply have no option but to go along – or risk serious deprivation in the short term itself.

This clearly indicates that while the choices of fishers might be an appropriate way to go forward, they will need to be supplemented by development initiatives to support, strengthen, or regulate the choices in order to move them along more sustainable and equitable lines.

Presenting the LED Assessment Framework

In this chapter, we tried to analyse the livelihood choices made by fishers by assembling the many elements that go into these choices. We also decided on a simple way to assess the choices from the standpoint of sustainability and equity On the basis of this analysis, a provisional Livelihood Enhancement and Diversification (LED) Assessment Framework has been developed to assist development agencies in assessing the viability of new livelihood opportunities in four steps:

- Step I: Developing a detailed LED Checklist
- Step II: Assessing viability of different options
- Step III: Sustainability Impact Assessment for different components of a livelihood choice
- Step III: Assessing mitigation measures to enhance the sustainability and equity impacts

Annexure D presents a detailed LED Assessment Framework based on the LED choices discussed in foregoing chapters and the factors contributing to those choices (as presented in this chapter).

[54] *As anyone working with fishing communities knows, the best justification for curtailing some of the destructive practices always comes from the fishers (often those indulging in such practices themselves), who have first-hand experience of what they have been doing to the resources. This also makes the familiar development theme of 'lack of awareness' as being responsible for the fishers' practices, and the plea that they should be made "more aware": sound hollow.*

Chapter 6: Assessing the Livelihood Initiatives of the Tsunami Programmes from LED Perspective

Assessing LED choices in the post-tsunami period

As we have seen, several LED initiatives of fishers were made possible by initiatives taken by the government and, to a lesser extent, by civil society organisations (NGOs, INGOs, bilateral and multilateral agencies). In fact, the process of modernisation could not have been possible but for its active promotion by the government. Several post-modernisation responses continue to draw upon such support.

A comprehensive review of externally directed LED initiatives in coastal fishing communities is not possible here. But a microcosmic view is attempted of the scope and performance of many institutional livelihood support programmes set up after the tsunami along the coasts of Tamil Nadu and Kerala.

Post-tsunami livelihood programmes have already received much critical attention. We do not wish to present detailed arguments for or against them all over again. We will briefly review specific programmes implemented in the areas covered during our field study. We will assess how the concerns and choices of fishers on various interventions – as stated by them — are reflected in the programmes[55].

The main livelihood support programmes for fishers in the field study areas related to: (i) supply of FRP boats with nets; (ii) self-help groups, mainly focusing on women; (iii) post-harvest initiatives – solar fish dryers, insulated iceboxes, fish transport systems and infrastructure such as fishing harbours, fish landing centres, fish- selling kiosks); (iv) alternative income- generating activities.

The mammoth housing and shelter programme for fishers has radically transformed several fishing communities and enhanced their livelihood context in some ways[56], but it continues to be regarded as separate from the livelihood programmes.

Relevance of programmes from a LED perspective

When we compare fishers' responses to the post-tsunami livelihood programmes to their responses during different phases of the development of the sector, a few things stand out.

- How far did the tsunami initiatives reflect and address conditions prevailing in the sector? Whether it is resource declines, capitalisation and risk, or market fluctuations, the tsunami initiatives by governments and development agencies could not proactively address these concerns. Given that the fishers have been trying out a number of options, some of the tsunami initiatives do seem to relate – albeit inadvertently – to these concerns. But the agencies behind the initiatives remain unaware of crucial links (such as the livelihood implications of shelter programmes).
- Second, comparing the LED choices made by fishers with the post-tsunami initiatives, one concludes that the tsunami initiatives focused too strongly on a few options, while ignoring many other options.
- Third, sometimes a 'fit' does occur between the tsunami initiatives and the LED options of fishers. The self-help groups (SHGs) and enhancement strategies related to them are an example. (Diversification of fish trade, optimising operations, loss-reduction strategies, turf protection, political strategies). But the opportunity to build on these strategies is being recognised only now. The initiatives and their programmes must be reoriented, and that's risky. Or new activities must be carried out on the existing organisational base – the viability of the activities then uncertain.

Let us now quickly summarise the sustainability-equity implications of selected programmes, using the checklist presented earlier for assessing different kinds of sustainability.

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[55] *A major problem must be noted. Generalising results from a few tsunami-hit locations to a wider area is that so many people have been doing so much in so many directions that it is almost impossible to arrive at one 'grand truth' about them.*

[56] *It enhanced their financial asset base by providing them access to much-needed 'collateral' for obtaining bank credit. It improved their quality of life which is an essential livelihood asset. It enhanced equity at the community level (where the poorest people received houses of a same quality as those of the richer people) and at the domestic level (ownership of the houses is held jointly by a man and his wife). It even gave rise to a yearning for social/economic upward mobility which translates into seeking new options they would otherwise have avoided. (Some women in the Killai area disdain the subsistence-oriented kanna thoni fishing and prefer instead to set up small businesses or keep chickens or learn new skills).*

1. *Environmental/ecological sustainability*

It is common knowledge that over-capitalisation and competition lead to overfishing, destructive fishing and resource depletion. Yet, the supply of boats has been indiscriminate; it can gravely damage the environment. Many of the new FRP boats may engage with profit in ringseine operations – these supply Kerala markets with the small pelagics they are looking for. But these operations could impact severely on natural resources. A positive factor is the possible shift from heavily exploited inshore demersal fisheries to less exploited small pelagic resources of the Bay of Bengal region. But data on this is lacking. It is therefore necessary to apply precautionary principles here and assume that the overall impact could be negative until proven otherwise.

SHGs (which can provide some funds) and onboard iceboxes (which can help boats to stay longer out at sea) may further encourage over-supply of boats, though this has not happened so far. But bank support[57] does enable the mechanised fleet in Nagapattinam to undertake more intensive fishing trips. This is indeed happening, and it causes concern.

Here's a story about sensitivity to the environment. Livestock and poultry imported from abroad were provided to a coastal village as part of an income-generation programme. The animals died within days as they were not used to a coastal environment.

2. *Technological sustainability*

FRP boats

Good-quality FRP boats would indeed have been useful for tsunami-hit fishers. But quality of many of these boats were of concern, and developed problems minor or major in just a few months. They seemed unable to withstand either local conditions or the uses to which the fishers put them. Fishers can't maintain and repair these boats on their own.

Post-harvest activities

The new fishing harbours which have come up after the tsunami apparently cater to mechanised trawlers and exports. But they fail to help large numbers of people who depend on the local trade in fresh and processed fish. Further, the harbours haven't taken into account global trade requirements (SPS provisions, for instance). Even a major fishing harbour like the one in Nagapattinam will need to be upgraded to meet minimum standards.

Landing facilities such as auction halls set up in several villages are certainly welcome, they will improve the quality of artisanal fish landings. But the central location of these facilities means that many fishers landing fish on the nearest beaches will have to trudge long distances to auction halls.

Ice boxes to preserve fish are a viable technological intervention. This can't be said about solar fish dryers, a number of which have been set up all along the Coromandel Coast. The study team took a look at five of these solar dryers: they had been used very sparingly. In fact one dryer had been used just once or twice though a local women's group had got it more than a year earlier.

Sun-drying of fish is simple and effective, and costs nothing. Solar fish dryers therefore will find few takers.

Alternative income generation

Two new-enterprise ideas mooted after the tsunami were production of fishmeal and of tuna-based 'masmeen'. But there are questions about both. They are availability of raw material, maintainence of quality(tuna),complex processing requiremnts and uncertain demand. The employment it can generate is also limited. Some of the fish has much demand in fresh condition , making it unjustifiable to convert into fishmeal. So it is better to explore opportunities to sell them fresh . Providing women with ice storage mechnisms as per their demand could be a simple solution.

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[57] *Construction of new fishing harbours (or strengthening existing harbours) can lead to an increase in the fishing fleet.*

The making of incense sticks is a promising enterprise that builds on existing strengths. There's good demand for the product. Incense-stick making is a tedious task. Like shrimp peeling, it is a low-comfort activity, but ideal for those without assets willing to work hard. Since it is manual in nature, there is no competition from big players. The activity won't be hijacked by a large-scale entrepreneur – something that happened with pickle-making. Finally, the activity can develop as a cottage industry for women sitting at home or working in groups.

3. Economic sustainability

FRP boats

External agencies subsidized fishers' investments in boats; traders or moneylenders subsidized working capital. While access to private credit sources is sustainable, the cost of credit remains quite high. The newly initiated SHG credit is not substantial enough to meet fishers' investment needs.

Many boats on the Coromandel Coast undertake selective fishing trips, mainly during good fishing periods. With capital investment securing just one-off support, and credit from private sector being a major drain on incomes, many fishers face problems when confronted with the need to invest for repairs and replacement.

The market demand for fish is certainly big and the arrival of ringseines may have strengthened this further, but whether this will be a sufficient buffer against future investment needs is uncertain. The economic sustainability of the FRP boat operations is thus doubtful. At the moment, it depends on ringseine operations, while fishers who don't own ringseines are selling out their shares or keeping their boats on the beaches waiting for a good season.

SHGs

For fishers, the most important outcome from the SHG mechanism is access to credit, and there are reports everywhere that this has reduced their dependence on moneylenders. All along the coastal areas, petty fish traders have become members of local SHGs[58]. They save the minimum required to be able to obtain loans for their businesses.

That many women traders made investments within Rs. 3,000-5,000 means that the SHG mechanism is sufficient to meet their needs. But it is not sufficient for men, whose production-related needs are often much higher (and more frequent). In villages like Parangipettai, access to SHG credit has reportedly brought down the private moneylenders visiting the area to a third of their original number.

While the SHG idea thus has much to commend it, fishers see several shortcomings in the practice. It compares poorly with private money lending operations in villages in several respects:

- **Ease of access to credit**: Among the three sources of credit – banks, SHGs and moneylenders – fishers consider moneylenders the easiest source, because they are the quickest and avoid formalities like record-keeping. Banks and SHGs suffer from red tape, lack of fit between repayment cycles and fishing cycles, repayment procedures. The poor are hobbled in the matter of credit by their inability to save, domination by the elites, disproportionately high transaction costs, poor repayment history of previous borrowers.
- **Adequacy of support**: Partly because of existing rules and partly because of a woman's savings record, the money she can get as loan from an SHG is limited. It limits her ability to invest in business to capitalize on an opportunity. Private moneylenders give credit based on opportunities.
- **Fit with fishing cycles:** The loans from the private moneylender are timely and fisher-friendly. The fisher can borrow money right on the beach if a money-making opportunity presents itself. More importantly, these loans are tailored to cater to the fishing sector. The recovery mechanisms take into account seasonal lull in fishing operations and allow fishers to skip payments for a turn or two. Secondly, payments to the moneylender are on a daily basis. These match the production

[58] *Often more than one SHG, although this is no longer possible as fewer NGOs operate in each area.*

cycle of fishing operations, which are based on daily turnovers. The fisherwoman takes a loan, buys and sells fish, returns money at the end of the day and starts a fresh transaction the next day. This fit seems to be lacking in most SHG operations.

- **Risk-sharing:** Another advantage that private moneylenders have over formal systems is that they share in the risk. When a fisher loses his or her investment for any reason, the private moneylender quickly helps him to restart operations in order to get his original investment back. In formal streams, a loan must be repaid irrespective of how it is performing.

In other words, credit from banks and SHG programmes still remain largely in the development mode and not in the commercial mode. The opposite is true with private moneylenders. There are other points about SHG credit, which reduce its effectiveness in meeting women's credit needs:

— Making women shareholders in many of the joint enterprises such as dried fish trade reduces its effectiveness for women.

— A sort of 'moral policing' is implicit in several SHG credit transactions. When a fisher seeks a loan to organise a wedding (to pay a dowry, for example), the SHG implies that this is inappropriate and they ought to be more prudent in spending. The household is part of system and may not fit into the development objectives of the credit being provided.

— Fishers fail to get credit when they need it the most. In the SHG, largely artificial distinctions are made between consumption and production needs to assess the need for credit. This is a handicap when credit is a livelihood strategy for parts of the year. Lack of access to credit for consumption has a direct impact on the productive capacity of the household.

Post-harvest activities

Centralised landings attract more traders to harbours, making hrbour operations more profitable. Harbours also provide growth opportunities for various ancillary activities. But the economic sustainability of fishing harbours and fish landing centres is a growing problem: if users pay for the services they get, they will get into the red. The idea is also politically difficult to implement.

Ice boxes are viable, but the viability of solar fish dryers is doubtful. They are expensive to set up — in one village, it cost some Rs. 6.5 lakhs to erect a solar dryer with a capacity of about 50 kg per day. Processors can't afford to set up such a dryer.

Apart from capital costs, which are subsidised, operations don't generate a profit. Economies of scale don't favour solar rack dryers, especially vis-à-vis sun drying. The capacity of the dryers is another problem: with capacities ranging from 50-100 kg per cycle, they can hardly meet the needs of a large-sized processor.

The idea of collecting dried products from solar dryers operating in different parts of the coast for sale through a centralised market system is trying to justify an activity that has little justification from the livelihoods point of view..

Data is not available on the economic viability of transport systems, fish kiosks and value-added products. Some of them started very recently, some others (like the value-added products) are yet to be commercialised. Some ideas, like centralised fish kiosks for sale by women, ignore the fact that women's business depends on door-to-door sales and personal relations with buyers. Other ideas, like fish transport systems, are still largely in development mode, not in commercial mode. Their sustainability hinges on continued external support and subsidies.

Alternative income generation

The viability of enterprises promoting value-added products seems uncertain. Neither profitability nor job-creating potential seems promising. The women in Sinna Mudaliar Savidi buy fish pickles in small quantities from a group in the neighbouring village, but see no point in learning the 'technology' for making pickles: they know that the market can't sustain more than a few enterprises.

The economic viability of livestock and poultry is linked to the socio-cultural environment, and that varies from place to place. Doll-making created a stir initially, and tapped the sympathies of the outside world for the tsunami-affected, but now seems to be regarded as a short-term activity. A re-assessment is needed, because the women trained to make these dolls have earned decent sums of money for nearly two years now. Loss of this income, which has changed their lifestyles, will be a serious blow if project support to the activity ends.

4. Social sustainability

FRP boats

More boats, more co-ownership arrangements. The poor may have improved their access to fish resources after the tsunami, but there is no evidence that increased effort led to increased landings. Wherever ringseines were used, landings did go up. But this did not mean better access for the poor on the shore.

The impact of the new FRP boats on local social systems and networks has remained positive or neutral. The exception is when they triggered rifts between mechanised boat owners and crew and led to polarisation in some villages[59]. Although the emergence of a large new boat-owner class could create new social systems, it does not seem to have happened.

The FRP boats could have had a negative impact on catamaran operators but didn't, perhaps because everyone got an opportunity to switch to FRP boats. If anything, the fishers are moving back to their pre-tsunami status, by shifting to non-motorised operations (at least seasonally) or mechanised operations (as crew).

Mounting operational costs and the emergence of new fishing gears like ringseines have ensured that ownership of fishing assets remains with fisher groups. There are also several examples of ownership reverting to individual hands (in Pazhayar and Arcot Thurai, for instance, where individual ownership had been the norm in the pre-tsunami period). But the group ownership phenomenon in other areas indicates its viability as a livelihood enhancement strategy.

More outsiders have come into fisheries because of more boats being available. In Pazhayar and Arcot Thurai, for example, FRP boats are operated partly by people from outside fisheries. This may have been happening even before the tsunami[60], but the increase in boats has encouraged the process. The outsiders are from very poor backgrounds, so this phenomenon has been good for equity. But can the system cope with the increase? It is a matter for concern.

The FRP boats' impact on households is also worrying. Women's incomes from fish trade (or from fishing, as with ***kanna thonis***) have become more consistent within the family. In fact these incomes even subsidise the cost of FRP boat operations.

SHGs

Three SHG issues raise concerns about equity:

- Who gets into an SHG and who gets left out? It is frequently the poorest of the poor who seem to be left out. In some villages, although every woman was a member of an SHG, her access to credit depended on her savings, so the very poor with no savings got no credit.
- Focus on individuals rather than on households. As we have seen, the livelihood base of the fishers is increasingly shifting from individuals to households. The focus on women for credit support – to the exclusion of the other members of the household – does not help the cause of livelihood support.

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[59] *Such rifts were temporary. They have been reported in villages like Pazhayar. But the mechanised fleet owners were happy to accommodate their former crew on their boats. At least some of the crew moved back to the mechanised boats.*

[60] *It happened in Arcot Thurai. Owners of mechanised boats employed local people to operate their motorised boats while they migrated to other places bordering the Palk Bay for mechanised fishing.*

- Recovery mechanisms in SHG systems are based on peer pressure and the fear of social disgrace. This is said to hinder rather than build cohesion within the groups. The conditions for obtaining loans and subsequent loans, both for individuals (who must repay one loan to get another) and groups (which must ensure that everyone in the group repays before a person is eligible for another loan), are constraints for the fishers.

Post-harvest activities

Growing infrastructure and better landing centres may draw outsiders in large numbers and marginalize the poorer stakeholders in supply chains. At the same time, as visits to major fish landing centres show, access to a range of fish helps the poorer stakeholders. It even allows them to develop new livelihood opportunities (fishmeal-related activities in a fishing centre like Pazhayar provide opportunities for eight different kinds of stakeholder groups).

Alternative income-generation activities

What happens when you try to develop alternative income-generation activities based on local options without considering their equity implications? One of the villages visited during field work yielded an interesting example.

In this village, some local women successfully ran small individual textile businesses. After the tsunami, an NGO encouraged its SHG members in the same village to start a textile business as a collective. None of the women already in the trade was a member of this group. The collective soon started operations with working capital obtained from the NGO. Since it operated on a fairly large scale, it could afford to sell its goods at smaller margins. Members of the collective shared its tasks (buying, selling, recovering instalments), the NGO offered advisory, monitoring and accounting support.

Unable to cope with the competition from this collective, some of the individual traders wound up. They know that the collective would not last long. With 15 women sharing low profits, and the eventual withdrawal of subsidies and services by the NGO, the enterprise was inherently weak. But before that happened, it drove the existing women traders out of business too.

The rice business provides a similar example. Some women of limited means made a living as rice sellers. An NGO got 15 women to start selling rice as a collective. The existing rice sellers were ignored, though the NGO was aware of their existence. The NGO believed that competition would be good for trade! Now the women find themselves competing with a collective that has much better access to capital, supply sources, markets and management skills. Whither equity?

5. Institutional sustainability

FRP boats

The FAO has promoted the precautionary approach in fisheries to prevent overfishing and resource depletion. It discourages subsidies that enhance fishing capacity and effort, especially in inshore waters. In this context, the large-scale promotion of FRP boats after the tsunami is counter-productive.

Strong and growing market demand makes fishing a very sustainable activity provided the supply base is equally vibrant. Kerala markets have spurred boats on the east coast to switch to ringseines, which have boosted local economies for the time being. How sustainable is this phenomenon?

SHGs

For an SHG to become a strong and independent entity requires much time, effort, patience and investment. The ability of external agencies to support the SHG over a long period is doubtful. The future of several recent initiatives launched primarily as vehicles for providing credit is doubtful. There are few efforts to forge links between the SHG and banks to ensure sustainability.

Post-harvest activities

Some of the post-harvest activities now being implemented are group-based. Success calls for institutional mechanisms and for people with knowledge and market orientation. The future of these activities after withdrawal of external support seems doubtful.

Making fish transport vehicles available to women's groups is a good idea in theory. The problem is that while the women do need such assistance, they do not have skills or experience in managing vehicle transport, which is a male-dominated business. The women have their own operations to look after. A different mechanism is needed to manage the vehicles.

Alternative income generation activities

The success of new initiatives on value-added products needs strong and consolidated market demand. This still remains a grey area. On the other hand, there already exists a sizeable market demand locally for fresh fish. Women have already developed several enhancement strategies to meet this demand. Greater emphasis should be placed on strengthening existing systems and networks.

One reason institutional approaches at livelihood diversification fail is that they consider livelihood support in economic terms: as maximising returns or optimising costs. If people are fishing with a wooden boat, they should move into an FRP boat; a non-motorised boat must give way to a motorised boat; the local petty fish trade must give way to a collective corporate venture for supplying high quality fish to super markets in urban centres (it is always super markets, for some reason) or markets abroad.

That the people themselves may have different expectations from their livelihood choices – for example, they may be less interested in increasing productivity and profits and more in improving their comfort factor or social status – has no place in economically oriented models, and rarely features in any framework of analysis of options[61].

Options for improving the performance of the tsunami initiatives

For a market-related activity to be successful, the basic ingredients include: raw material (fish, in this case); technology; investments; markets; and appropriate social organisation. For economic use, each of these ingredients must be available physically, accessible to users (in entitlement terms) and appropriate to the context. These can be assessed for their sustainability and equity implications against a range of indicators, as summarized in the table below.[62]:

Components that make up a strategy	*Criteria for assessment*	*Indicators*
Assets: • Raw material (natural resources) • Technology • Employment potential • Investment • Social organisation	• Availability	• Quantum of availability • Backward and forward linkages • Steady availability: o Over time o With increased usage/competition o With improved efficiency of systems/processes • Capacity for regulation
Policies, institutions and processes: • Market demand • Policy and institutional frameworks	• Appropriateness	• To suit local ecological, economic and social context • To achieve economies of scale • To suit market demand • Convergence with macro- and local-policy goals
Livelihood outcomes: • Real income	• Accessibility to different stakeholders in the activity	• Affordability of access, usage and upkeep • Steady access: o Over time o With increased usage/competition o With improved efficiency of systems/processes • Location (physical and hierarchical) • Distribution of benefits • Implications for other stakeholders directly/indirectly affected

[61] *A good example might be the efforts that went into improving the quality of traditional fish processing along the South Indian coast for well over a century: in spite of everything, and to the continued mystification of their promoters, hardly any woman has found the energy, patience, interest, enthusiasm or investment to make the change to a better quality processing system, so much so that new projects for improving traditional fish drying systems have become a sustainable livelihood source for bands of researchers.*

[62] *This is just another way of presenting the sustainability checklist presented in the previous chapter.*

When we look at the different tsunami livelihood initiatives, they do actually cover some or many of the requirements:

- Access to resources and technologies (FRP boats)
- Access to investments (SHGs)
- Access to markets (post-harvest infrastructure and tools)
- Access to social organisation (SHGs)

But three things stand out in this connection:

- No activity seems to cover all the basic requirements
- Within the same activity, all three criteria – availability, accessibility and appropriateness – are rarely covered; thus, FRP boats increased access to resources, SHG groups enhanced access to investments.
- Also within the same activity, different components do not meet all sustainability criteria – including the institutional, which relates to the capacity of existing systems to continue after the withdrawal of external support.

A major grey area is the extent to which new activities draw on the choices of fishers themselves: the process of 'building upon strengths' is weak.

Thus, we may conclude that the there are some gaps in post-tsunami livelihood programmes in addressing the real needs of communities as well as in relating to the existing LED strategies of fishers. Activities such as SHGs that can help the livelihoods of fishers are not able to the get the best of results as they are often not tailored to suit their needs. Some others appear to be unsustainable – either economically, institutionally or environmentally. There is scope for improving the performance of some of the initiatives, but this is possible only by making the activities more people-centred and by building on the asset base of fishers.

Just as LED choices made by fishers need better institutional support to be effective, it is equally important for external support mechanisms to draw on the strengths of the fishers to become more effective and sustainable.

The scope for suggesting specific options depends on two factors: — to what extent is an activity amenable to improvements? — to what extent do implementing agencies have the capacity, time and interest to pursue these initiatives? The diversity of options pursued and the varying levels of their performance indicate the need for caution in suggesting improvements to activities.

Quickly, let us see what initiatives can improve activity performance, going by the LED choices undertaken by fishers.

Boats and nets

Concerns on environmental sustainability can be addressed by setting up mechanisms for self-governance to improve management conditions. This will need work at both the local and macro-policy levels. Diversification of fishing operations might also be explored. On the technical front, defective boats must be repaired with external support. Economic sustainability can be improved by :

- Reducing costs of operations
- Reducing losses, thereby increasing returns
- Reducing costs by sharing them
- Reducing costs through technological innovation

For institutional sustainability, it is necessary to implement a self-imposed ban on further introduction of FRP boats.

SHGs

For SHG initiatives to be environmentally sustainable, a control system is needed to restrict investment by SHGs in new fishing implements. For economic sustainability, SHGs should jell better with the livelihood strategies and operational cycles of members. To ensure social sustainability, appropriate niches should be provided for poorer stakeholders in the SHG mechanism. Institutional sustainability can be achieved if SHGs acquire a stronger business orientation, forge links with formal banking institutions, and gradually transfer ownership to members.

Post-harvest activities

Fixing a ceiling on the number of boats that can be operated from a fishing harbour and setting up mechanisms to ensure that this happens is important, to ensure that the new infrastructure does not mean a whole lot of new boats. Diversification strategies to cover other stakeholders in non-shrimp supply chains and a better fit with emerging needs for the global trade will also be necessary to improve their technological sustainability. Mechanisms for management and maintenance will need to be assessed for their economic sustainability.

Other post-harvest tools

Providing insulated iceboxes to petty traders, larger ice storage mechanisms to villages – these will need to be assessed to improve returns for the petty traders. For the dried fish makers, the best option would be to improve the quality of sun-dried products through simple loss-reduction methods. This will enhance the technological and economic sustainability of the activities. No further introduction of solar fish dryers can be encouraged until the existing ones have proven to be useful. Their use should be monitored regularly – not so much to promote their usage as to assess how the processors relate to them. Proper management and maintenance mechanisms should be developed for organising group-oriented activities like fish transport systems to ensure institutional sustainability.

Alternative income-generation activities

A proper needs assessment should be done to identify options to improve existing systems. This should be followed by a proper sustainability-equity assessment (using an LED Assessment Framework) before launching any new AIG activities.

Chapter 7: Opportunities for Enhancing Livelihood Choices

A case for reappraisal of some perceptions about livelihoods in fisheries

In this final chapter, we shall first try to put forth a case for reappraisal of some of the common perceptions on fishers, fisheries and livelihoods.

Capacity of the fisheries sector to provide sustainable livelihoods

The most important point to make is that not everyone in the sector is moving out, or faces the need to do so; diversification out of fisheries is not a compulsion for *everyone* in the sector. This is not only because of lack of opportunities elsewhere, but also because the sector itself is quite robust to cope with the demands of the people depending on it. There are several strong reasons to support this contention.

The first of these is the quickly renewing, multi-species fisheries of the Indian waters that do not allow *all* fish varieties in *all* areas to be over-fished at the same time. When the fish catches drop below a certain level (economic overfishing), the fishers immediately move to other species or – as we have seen – move out into other areas or occupations, because it simply does not make sense to go on fishing even after the profitability levels had come down.

Motorisation of the fishing fleet too does not allow people to go on fishing when the returns stop comparing favourably with the cost of operations. What this means is that a majority of fishers stop fishing when conditions become unfavourable; this allows depleted fish stocks some time to recover[63]. Most long-term migrations have been a result of depletion of fish stocks in an area, which indicates the existence of an inbuilt mechanism to address the issue.

The second factor that is in favour of the fisheries sector is the strong market demand for fish: the impacts of the global trade demands on Indian seafood did take a toll, but they also allowed people to shift attention from one major species to a range of others, from high-return and high-risk international markets to domestic urban markets. While one cannot support the growth of ringseines without knowing more about their implications, one can point to the fact that their growth had nothing to do with shrimp or the export demand and depends upon what until recently were considered problem species on the east coast: small pelagics. This is a trend apparent in most of the coastal areas. Moreover, the urban demand for fish is hardly tapped, as fish travels only to a handful of markets in the interior. The demand will continue to grow for a long time to come.

The third factor that supports the capacity of the sector to provide livelihoods is the diversity of livelihood opportunities that the sector provides. Social and economic mobility has always been a strong characteristic of the sector and this helps people to move up or down and horizontally in different directions[64] making subtle to radical adaptations, but staying on somehow.

Within the existing activities too, as we have seen, there are so many opportunities for adaptations: reduce the net size, change the nets altogether, use engines sparingly or not use them at all, reduce the size of crew, make changes to their composition change the sharing patterns, change fishing grounds, and... the options appear to be endless. When it is considered that the women in fishing communities are as versatile – if not more so – as the men, then the options multiply by many times, especially as the women don't shirk from working in other sectors too. All this implies that people can survive one way or another within the sector.

The fourth characteristic is closely linked to the one above. Fishing having evolved from a practically no-costs operation into a big business with high stakes, many people still have the option to move back. It will not be easy – as moving back to a pre-electricity age will not be easy for any of us – but it is possible and is already happening as the examples show.

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[63] *That is, those fish stocks that had been depleted as a result of overfishing, because stock depletion also occurs because of larger ecological changes reducing their productivity.*

[64] *It is quite possible for a boat owner to become a crewmember, then a trader, then a boat builder and finally a boat owner again, all in a matter of 18 months.*

In other words, fishers can go down the ladder to an extent where they will not need to invest anything more than their skills and knowledge again, and still be able to survive, a factor that prompted a fisherman to quip: "There is no bottom to the barrel". That they can move up the ladder with equal rapidity – and lead up to the conditions as they are now – needs attention too, but it is a fact that their capacity for mobility helps them to survive for as long as it takes.

The fifth is a comparative one: of all the primary sector operations, and many secondary sector ones too, we observe that fishing and related activities are still the more lucrative – or at least pay better – even if less certain. The famous (notorious?) lottery mentality of the fishers stems from this hope of striking rich one day, but it is indeed possible for people to earn well in the fisheries sector as in no other sector. Apart from boom-and-bust opportunities, fishing is still characterised by occasional good catches which keep the operations viable overall.

The sixth, also comparative, relates to the state of affairs in agriculture: fragmentation of landholdings, concentration of ownership, technological developments, competition, failing investments, successive crop failures, reduced access to basic needs like water and electricity, reduced subsidies for various inputs, and failing markets and market mechanisms have all driven people into an extremely precarious position. In comparison, the conditions in fisheries remain a lot more stable and strong.

Finally, we cannot ignore the strong social bonds that keep people in the sector together: these may have weakened due to new compulsions, but they still hold good and also hold the communities together. After everything is said and done about their iniquities, their oppressive and medieval mindsets, and their caste-roots, the fact remains that the community governance systems are still the most important support system for many people in the communities, especially the poor. Such caste codes and the social bonds provide people with the confidence to take their access to the sector for granted and to find adequate support for making a livelihood out of it.

All the above factors, together with the fact that there are not that many options outside, would justify the contention of the fishers that fishing and related activities in the sector are still the most important choices for them. As one fisher suggested, as long as there are fish in the sea, they will survive[65]. The fishers cannot take up options in other sectors with the same level of confidence and so, livelihood enhancement will always remain a more practical option for them than livelihood diversification outside fisheries. Under the circumstances, we can conclude that any alternative income-generating activity can, at least in the short-to-medium term, only supplement existing livelihoods rather than replace them completely. It makes sense for any livelihood support programme to begin by addressing the issues that have an impact on the existing livelihoods of the fishers.

Does this mean that the crisis we have discussed in an earlier chapter doesn't exist?

The crisis does exist and takes its toll; people are certainly facing severe hardships and also being squeezed out as a result of the various changes in the sector, but it has to be realised that the changes themselves have less to do with the capacity of the sector to provide sustainably to livelihoods and *more to do with the way the access to the resources has come to be organised.*

This calls for measures to undertake some systemic changes within the sector rather than moving people out, which is like treating the symptoms rather than the ailment and, going by past experience, a cure worse than the disease. The various livelihood enhancement strategies we have discussed above are people's responses to the need to set the system into some sort of order, or at least cope with the changes from within the sector, and while the responses might or might not be appropriate or adequate, there is no doubt that for a majority of people in the sector this is the way forward.

Status of natural resources

While recognising the impact of declining fish catches, it can be argued that apart from physical non-availability, there is a need to broadbase the issue to include the access issues (i.e. entitlements) as well.

[65] *That this is true in many areas is proven by the fact that the fishers do not show an inclination to move into other opportunities in the neighbourhood – agricultural work or, in the tsunami context, house construction – and, which if they were really desperate, they'd happily do as history shows repeatedly.*

This will require taking another look at the question of fish declines, not so much to dismiss the idea as a myth or to justify the existing state of affairs, but to broad base the scope of debate on the issue and to highlight how several social, economic and political factors are caught up in it.

It is also important for two other reasons: to allow the scope of any proposed management regime to look beyond simple fish conservation measures, which seek to further curtail access to the resources for the fishers. Second, this is to dispel the preoccupation with the physical non-availability of fish catches, which is taken as a measure of the inability of the sector to provide sustainably to livelihoods and gives rise to a blanket preoccupation with finding 'alternative income generation' avenues for the fishers, irrespective of whether they need them or not.

Firstly, there is a need to realise that fish declines and 'fish famines' have all along been characteristics of fisheries, instrumental in the migration of thousands of people from the entire east coast of India to Malaya and Burma in late 19th century. In fact, the history of fisheries (as documented, for instance, in the excellent reports of the Madras Fisheries Bureau) is characterised by periodical ups and downs, forcing people to move out and move in at all times. This is not to say that knowing this will lessen the impact of deprivation it entails, but it will allow us to take a more historical view of the problem and not see it as being unique to our age. What is unique about the current crisis is that conditions in the sector – and beyond it – are such that people cannot simply move out as easily as they used to in the past.

The second point relates to how the fishing conditions change from year to year and from place to place even now. The same fishers who painted a bleak picture about conditions in the sector in late-2005 would present an extremely rosy view of things in early 2007 because 2006 had been a good year! Partly, this has to do with the boom-and-bust opportunities like ringseines, but largely, it has also to do with the fact that conditions in fishing are never so constant as to show *only* declines.

As we indicated above, the quick regeneration capacity of the resources – at least some of them – allows some balance to be achieved sooner or later. Also, the extent of exploitation of the fisheries varies from place to place[66], implying that it may not be possible to generalise catch declines across the country as a whole. As to why then people from certain areas keep going away and show no signs of intending to return in the near future[67], the answers lie not so much in the lack of fish in the sea as in their weakened *terms of access* to the resources (need for investment, indebtedness) or to the strength of the pull factors (as in the case of Gulf Migration).

Such considerations apart, there is no doubt that the health of the resources – especially in the inshore waters – is certainly not very good, and one factor has been pointed out repeatedly as the main culprit for the state of affairs at sea: *open access*. However, open access by itself could not have had such a major impact if, for instance, it had happened in the pre-modernisation phase when the level of technology and markets, and the existing social organisation, were major deterrents for increasing effort.

In the modernisation phase, open access at sea allowed entry of superior technologies, but it went hand in hand with changes in market focus (to exports) and social systems (with the role of government assuming increased prominence in the fishing communities), which actively sought to reduce or make redundant the social controls on fishing. This promotion of 'open access' on land was as important as the promotion of open access on the sea in contributing to the scramble that ensued. Thus, at least two other factors – increased competition and need for investments – could have led to conditions that reduced access to fish (irrespective of its availability), but all the same got translated into fish declines in popular perception:

There has been an increase in fishing effort as a result of increase in numbers of people and in fishing capacity. With physical labour being the most important asset that most households have, fishers have been increasing more prolifically than other communities[68]. This meant that there were more people competing for the same resources, which reduced the per capita availability of fish. The same applies to the increase in the size of fishing fleets: while their numbers increased, their range of operations remained

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[66] *For instance, there is no comparison between the fish harvesting systems of Kerala and Kanyakumari on the one hand and those of Orissa on the other.*

[67] *As for instance, the fishers from Srikakulam district in Andhra Pradesh*

[68] *The agricultural communities could not do so, dealing as they did with a finite and private resource, which was also subject to fragmentation over time.*

largely static (especially focused on inshore waters), which led to a fall in catch per effort. Modernisation helped to concentrate ownership of production tools in fewer hands, which meant that terms of access to the resources decreased for many people at sea and on shore.

Secondly, compared to the pre-modernisation economy, where every fish caught was net income, the conditions in the modernisation period were such that catches had first to take care of a number of other expenses: operational costs, debt servicing, depreciation of asset and the owners' risk, and whatever remained was the net income. In other words, if a fishing system earned Rs. 100 in the pre-modernisation period, its motorised counterpart in the modernisation era needed to earn eight to nine times as much to stay level.

While the market bore some of these costs, there is no doubt that the actual fish catches too had to increase to cope with them. As the markets – especially for shrimp – showed signs of weakening in late-1990s and early 2000s, and the production costs increased, they led to a depression in incomes, which were equated with a decline in catches themselves.

Impacts of modernisation on livelihood activities

There is a widespread perception about modernisation in general – and mechanised trawling in particular – as having had a negative impact upon the sector as a whole[69], and much of it is quite valid. The sustainability and equity implications of several modernisation technologies have not been positive and their contribution to the crisis in the sector is sizeable.

However, as this study showed, it is easy to overlook the fact that modernisation has been an important factor in generating new livelihood opportunities in the sector. Some of the new opportunities may have given rise to economic and social polarisation within the sector, but they have also been fair in terms of their access to the poor going by the fact that a major proportion of the people in the sector are poor. That modernisation may have contributed to their persistent poverty also runs counter to the fact that a vast majority of people in the pre-modernisation period too had been poor.

Likewise, mechanised trawling operations have drawn a lot of negative comment – in particular, for their impact on natural resources and on artisanal fishing systems – and quite rightly are targeted by fisheries management programmes. However, treating the trawlers as an independent entity in management programmes can be misleading. :Their existence is interwoven with a large number of livelihoods on the shore, as a visit to any fishing harbour will show, and many people depending on the trawl sector fall into the poor to very-poor category. For some of the poorest people in the sector – for e.g. single women with hardly any capital to invest – dealing in trawl bycatch is the only option to survive. In every state, petty fish traders from fishing villages travel long distances to fishing harbours where mechanised landings take place to get an assured supply of fish.

A good example would be the women from Kozhikode (and further south in Kerala) travelling to Mangalore and other important fish landing centres in South Kanara district in Karnataka to buy fish for sale back home. The impacts of any management measures on the trawl sector must take into consideration the livelihoods of these people. Otherwise the implications of management measures can be quite catastrophic for them.

On the other hand, some of the modernisation technologies made a positive contribution to the sector. An important reason why FRP boats (or the other intermediate boats like the plywood boats) are so much in demand with fishers is that the boats are perhaps the closest that Indian fisheries came to in terms of striking a balance between ensuring sustainability of operations and achieving economic growth.

Put simply, while the traditional catamaran economy was not efficient enough to take advantage of the opportunities that the fisheries sector provided, the mechanised fishing economy was far too efficient to be appropriate to the local ecological or economic context. In the modernisation period, the fishers were jumpstarted from the catamaran economy to the mechanised trawling economy without any preparation – naturally, they failed to cope with the change. Intermediate (i.e., motorised) boats were a natural next

[69] *Which is shared, among others, by the lead author of this study report*

step from the catamaran phase and were perhaps best suited for the sector and its people, although they actually appeared later than mechanised boats. They drew on the strengths of artisanal fishing practices (in terms of organisation of fishing effort) while being able to take advantage of the technology and markets that were the hallmark of the modern industrial economy (represented by the mechanised sector).

So when we see people moving from the mechanised sector to FRP boats, it is not a throwback to an early stage of evolution, but an adaptation to a more sustainable and viable mode of life. For many fishers, FRP boats are the best way to build upon their strengths while also taking advantage of modern trade opportunities. The successful evolution of urban/inter-state market supply chains largely dominated by the motorised sector is an organic outcome of a process of building upon strengths. It has to be admitted that one of the strengths that fishers do *not* have concerning FRP boats is a control over its technology – it remains alien and leads to dependence on outside help.

That the FRP boats themselves are becoming increasingly unviable can be ascribed to a serious failure of policies and institutions (the fishers' own included) to ensure their promotion along sustainable lines – to a lack of sense of proportion that characterises everything and everyone in the sector – and this is reflected in the case of post-tsunami initiatives as well.

So, one may argue that the ill-effects of the modernisation process are because of the way it has been handled – without foresight and a sense of proportion. It is a policy failure and an institutional failure, as we have indicated in Chapter 6. Given a more responsible and visionary approach, modernisation could well have led to more sustainable benefits all round. As we intend to show later in this chapter, this may still be possible, with more practical and needs-based approaches.

Case for livelihood diversification

So, from the above discussion, do we think there is still a case for promoting livelihood diversification?

The evidence from many places in the study area shows that, for a majority of people, fishing and allied activities will remain their main livelihood source for now and forever. There is a strong case to support existing livelihood activities by enhancing people's access to the necessary assets and policy-institutional mechanisms in order to help them make more viable livelihood choices. The conditions in the sector may not be as bleak as predicted, and the sector can certainly support a number of livelihoods in a sustainable manner. We have also seen that the options for diversification are really few — and not really much more viable than those the fishers would leave behind.

This is not to discount the idea of livelihood diversification altogether: it has all along been an integral part of life in fishing communities. It will continue to be so — as long as seasonality and disasters like fish famines hound fisheries. The changing livelihood context in the sector which seeks to optimise economic efficiency, also encourages shifting people out of the sector. It is very likely that a majority of these people would be the poor. This makes developing appropriate responses to their need for livelihood diversification urgent and essential. However, as we have seen, livelihood diversification cannot be based on simple 'A to B' calculations, and requires a more nuanced understanding of the people and their choices. Most importantly, it requires building upon the fishers' strengths, and developing the responses as organic outcomes of their choices rather than as artificial add-ons imposed from outside.

At the same time, it has to be realised that the local context – or the fishers' existing asset base – may not really be sufficient to address their need for sustainable alternatives. The fact that coastal villages have traditionally been isolated from the social mainstream reduces the fishers' options. Even the idea of individuals (or even whole communities) moving out of their native habitat is fraught with risk and uncertainty, aggravated by the loss or destruction of social networks and other traditional support mechanisms.

The problem becomes even more acute for marginalised sections within fishing communities. By virtue of their gender, geographical origin, marital status, caste or age, they constitute some of the most vulnerable people in society. Their access to new opportunities and their capacity to make meaningful use of them are suspect. A meaningful livelihood intervention must start with developing the basic skills, knowledge and capacity of fishers rather than with specific ideas for diversification and subsequent efforts to make people to relate to them – is like trying to put square pegs into round holes.

One other point needs to be noted: there have been very few successful examples of livelihood diversification outside fisheries. Even an activity like brackishwater aquaculture, which deals with the same products as marine fishing, has failed to be a viable alternative — because it has a farming rather than fisheries orientation. (It explains why many agrarian communities found it more acceptable than fishing communities did.

Who needs to diversify?

Broadly, for men and women already involved in production and trade related activities, the scope for diversification is limited, except where the new opportunities offer significantly better terms (regular and higher income, security of tenure, improved comfort factor and quality of life) or take the form of secondary activities that complement fisheries. Otherwise, men would keep juggling their activities to keep going as long as they are confident about the capacity of the system to provide them with something to live on.

It is the people in shore-based activities, especially those in the local fresh trade and the processed fish trade, as well as those who survive as ancillary workers capitalising on the informal nature of organisation of the sector, who face a more severe livelihood crisis. Even these people tend to diversify within their activities (go to different landing centres or markets) and scale down their investments through innovative means (group sharing, targeting different consumers) or even seek openings within the new supply chains[70], rather than move out.

The most visible diversification happens seasonally, when there is no fish and the fisheries economy itself is at a standstill. But then women treat it as a secondary occupation and continue to retain their primary allegiance to the fish trade. There are many occasions when they have abandoned agricultural operations midway through a harvesting season because fish landings improved suddenly. As a trader on the Coromandel Coast pointed out, she could earn in one good day's fish trade an amount equivalent to her wages for four or five days. Obviously, conditions are not uniformly so good everywhere, but the story highlights the pulling power of the fish trade.

The changes in access to resources have increased the number of asset-less and unemployed people in the sector, both men and women. It is these people who find themselves on the border of the sector, who could be squeezed out. They seem ready to try out alternatives. It is in such cases that livelihood diversification takes place at the household level; and the options taken span more than one activity. It is a risk-reduction strategy driven by vocational uncertainty.

Older people are some of the worst-affected by changes in access to resources. The traditional social security nets have weakened in many communities as a result of post-modernisation compulsions. The older people are forced to continue trading or engage in some other activity to earn their living. For such people, access to better welfare is a more important priority than efforts to improve their asset base and shift to a better livelihood activity. A similar point can be made about children forced to work in order to earn their keep.

Finally, there is a growing emphasis on literacy among the younger generation: in fishing communities. The first batches of educated youth came out in the early 1990s. These youngsters had a foot in fisheries, they mainly sought a government job. Educated people in the communities had a new social status (it turned into disillusionment in several communities when the youth failed to obtain good employment). This gave rise to the youth consciously alienating themselves from fishing activities.

With new opportunities in computers, telecommunications and industries opening up during the past decade, many youth have found openings in these professions, and have broken away from fishing. A large number of educated youth in fishing communities are willing to move out because of the opportunity to earn more and gain social respectability. The falling returns in fishing also push them to seek alternatives. It is these people who would be the most important target for livelihood diversification initiatives. It is

[70] *For instance, by obtaining supplies of fish or ice; or by working as carriers and transporters)*

also necessary from a management perspective: to reduce pressure on natural resources at sea and on the social and economic systems on the shore.

However, options for these youth are not easy either. They disdain primary sector activities; opportunities in the secondary sector vary from place to place. The services sector, into which most youth are moving, does offer jobs. But these are too diverse and varied. There is no single cohesive stream of opportunity. That these youth are as well equipped or poorly equipped as anyone in primary sector communities like agriculture means they have no special advantages and need to take their chances like anyone else.

Are men less adept at diversification?

One of the most persistent questions this study encountered was about the ability/interest of men to diversify: there seems to be unanimity in the belief that men in fishing communities are interested only in fishing. If they can't fish, they prefer to laze at home, while the women slog and sweat to sustain the family. This means men get left out of many diversification programmes.

Now, the easiest answer to this would be to refer to the livelihood diversification processes in different phases of fisheries development. Geographical migration in fishing communities has all along been a male-dominated process. It is frequently coupled with occupational shifts to non-fishing related activities (including rickshaw pulling, sanitary labour, timber and plantation labour, industrial labour) where they have sometimes been regarded as 'indispensable'. One might say that if the men were removed from their native habitat, there was no activity that they would not get into.

So why *are* men supposed to show little enthusiasm for other kinds of work? The question was posed to several women and men in the fishing communities (singly or in groups; separately or together) and the following is a gist of their responses.

Firstly, as we have seen, fishing is in the process of reverting to some sort of subsistence orientation in artisanal communities, mainly at the level of asset-less workers. This requires a change from individual earnings to household-based earnings to meet domestic needs. For many households, income from fishing (i.e., the men's income) takes care of such basic survival needs as food, clothing and shelter. Incomes earned by women from alternative occupations pay for all other needs (including healthcare, children's education, paying off old debts) besides adding value to the basic survival needs, such as ensuring sufficient food for everyone, being able to afford vegetables or fish[71] in the meal and so on. In many cases, it could be the other way too: i.e. women meet basic needs at the household level, while the men's uncertain income pay for additional investments, besides taking care of major expenses that cannot be met otherwise.

Under the circumstances, it makes sense for one member of the household, to stick to a profession, while the other looks around for alternatives. This ensures that the family can at least meet its subsistence needs while capitalising upon new opportunities as they come along. In most cases, it falls to the women to look around for new opportunities while the men stick to fishing. There are some strong motivations behind this choice:

The considerations of 'social status'[72] that fishermen talk about when asked to make a transition to a non-fishing activity are quite real and these have serious implications. By showing willingness to take up an irregular, low-paying and 'lowly' activity like agricultural labour, a fisher is signaling his failure, and this hurts his economic prospects. His access to credit from traders and moneylenders weakens, because he earns as a labourer than he could as a fisher.

He would also lose his social security. Membership of the caste panchayat may get cancelled, and this means foregoing some benefits. Example: In some areas, fishers are entitled to certain rights in a community – such as a share in the earnings from common property resources or the temple earnings. They can also seek community help for meeting some major expenses. They could, in the event of a contingency, get a

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[71] *One of the ironical outcomes of the growing market demand for fish is that many fishing households must buy fish for their own consumption: there is in fact a whole category of fish sellers who specialise in selling fish to fishing communities.*

[72] *Some of the outsiders' responses when fishers talk of social status and jobs can be quite patronising. How can a mere fisherman talk of social status? Doesn't he see that getting enough to eat must be his first priority? But when a middle or upper class family finds itself in dire straits, it prefers to starve rather than beg or borrow. This kind of behaviour would be considered acceptable, even noble. No one expects the head of such a family to seek work as a rickshaw puller.*

share from the earnings of all fishing boats on a given day. They could also get support from their peers in a number of fishing-related activities. Access to such privileges is weakened by a shift out of fishing, particularly a move to another area.

The other consideration is that most fishers interact little with the outside world or with markets and are generally far less articulate than the women — who are more exposed to the world as well as to market demands, and can tailor their skills to suit the occasion.; These are necessary prerequisites for successful diversification. Women's secondary income earning role gives them a certain degree of freedom and allows them to choose whatever is available irrespective of its long-term viability. That many women are single and lead a hand-to-mouth existence could mean that their affiliation to castes and to traditional occupations is secondary to their need to earn something to survive. Since they are willing to do any work, their options are wider. They are constantly on the look-out for new opportunities. .

Next, most alternative livelihood options suggested to the fishers were themselves not sustainable. House construction may be a major activity right now, but what will happen two years later? Or even now, if fishers were to move into it in large numbers? Women on the other hand could embrace such opportunities easily even if these are temporary.

Thus, the question of whether men are less adept at diversification than women is linked to several factors. When conditions get bad, people will indeed move out. When women from the Vadabalija communities of northern Andhra Pradesh coast tried to take up jobs in farming in the early 1990s, they were stopped by the local panchayat. It contended that caste codes did not permit them to move into agriculture. Less than three years later, a majority of women were working not only in agriculture, but in a range of other activities with the approval of the same panchayats.

Diversification has always been a household-level initiative. Instead of picking on either men or women for their ability to shift into other activities, it is necessary to consider the household as a unit. If diversification round the year is necessary to meet basic subsistence needs, the impact will be felt not just by men or women of working age, but also by children and the elderly.

Opportunities for enhancing the potential of the LED choices made by the fishers

When decision-makers or development agencies seek to enhance the LED choices of fishers, they could opt for either enhancement strategies or diversification strategies. With either strategy, interventions at the local level mean enhancing the immediate asset base of the fishers. Interventions at the macro or policy level must create enabling conditions for fishers to improve or widen choices.

Livelihood enhancement strategies

As we have seen, the LED strategies of fishers fall into four categories on the basis of their equity-sustainability implications. They are:

— **Green Box** strategies: Positive strategies that are sustainable in their own right and adequately incorporate equity issues.

— **Grey Box** strategies. These require some effort at improving sustainability or equity implications. Direct measures are needed to target the stakeholders concerned to enhance their asset base and cope meaningfully with livelihoods. .

— **Grey Box** strategies. These require greater effort at improving their sustainability or equity implications. These would be long-term and broad-based measures targeting policies, institutions and processes. The idea is to create an enabling environment that will help fishers to make choices that are more sustainable or equitable.

— Finally, the **Red Box** strategies. Neither sustainable nor equitable. Policy-makers must discourage this kind of strategies completely.

While the Green Box strategies are sustainable without additional support (although they can be further encouraged by scaling up their range and scope), the two Grey Box categories would require additional support to a greater or lesser extent. It is people carrying out "Red Box" activities who must be moved out into other occupations.

Let us now assess the extent to which external support would be required to improve the performance of different LED strategies. As we have suggested, access and entitlement issues are at the core of the crisis in the fisheries sector[73]. It should be endeavour of any livelihood support programme to develop mechanisms to address these in a sustainable manner.

1. Sustainable access to fish – co-management strategies

Fishers have responded to the decline in fish by taking to the following strategies:

- Fish loss reduction
- Diversification of supply sources
- Slash-and-burn fishing
- Protecting turfs
- Living for the day
- Technological innovations

Of these, slash-and-burn fishing and living for the day strategies will automatically go into the Red Box category. Fish loss reduction, technological innovations and diversification of supply sources are sustainable initiatives, whose performance can perhaps be improved further by simple local level initiatives. Protecting turfs, which includes self-governance mechanisms, are a crucial area where their own capacity may not be sufficient to obtain sustainable access to resources.

Sustainable access to resources implies two basic prerequisites: (i) assured access/use rights to resources and (ii) mechanisms for ensuring sustainable exploitation. One is not possible without the other. Merely having rights of access cannot ensure sustainability. Mechanisms for sustainable exploitation cannot work without assured access to a resource.

Assured access to resources is the basic theme of the different Marine Fishing Regulation Acts, which have largely been ineffective in delivering sustainable results. A draft fishery policy for Kerala, developed in early 1990s, proposed a radical 'aquarian reform' package, which sought to restrict access rights to the territorial waters to those who fish (Kurien, 2005:84), but remained un-implemented. The developments in the last 15 years have also showed that access to fishing grounds is not just a matter for different fishing systems within fisheries to determine. The number of claimants for access to the coastal and offshore waters has grown significantly and includes such powerful players as oil industry and shipping, which means that the assurance of access rights is even more difficult than before.

At yet another level, the implementation of new conservation laws related to Marine Protected Areas and prohibited fishing areas to protect sensitive resources like mangroves or coral reefs or turtles also disallow a simple parcelling of coastal waters between different fishing systems within the sector. Under such circumstances, developing mechanisms for ensuring access to resources for different stakeholder in the sector can be a Herculean task.

Coming to sustainable exploitation of resources, while co-management has been promoted as a viable alternative to the existing top-down, resource-centred, management measures, this cannot be viewed as a simple resource conservation measure aimed at greater efficiency and lesser costs. It implies sharing rights and delegating decision-making powers amongst the different stakeholders in the process. It also implies that co-management cannot be fixed system where a set of 'representatives' from the 'communities', from the 'industry' and from the 'civil society sector' can come together at regular intervals and make decisions.

It involves a much better understanding about the different stakeholders in the supply chains and the implications of any change at one level upon the others – both horizontal and vertical – and developing mechanisms to involve the different categories of stakeholders (especially the poor) in the process of decision-making at appropriate levels. The implications of bringing about changes in trawling, as we

[73] *It is in this respect that the current crisis differs from earlier crises in fisheries. : Lack of availability of fish characterized previous crises. It's failure of access that stands out in the current crisis.*

have seen, are important not just to those who operate the trawlers, but also all those who depend upon the mechanised sector. Unless these people are somehow brought into the decision-making processes, co-management will not yield the expected benefits.

In order for the co-management mechanisms to work, they cannot simply remain confined to natural resource conservation issues; as we have seen, the effectiveness of the traditional governance systems in coastal fishing communities stemmed from their capacity to take an equally active role on shore in distributional issues related to benefits, in addressing seasonal deprivation, and in acting as a link to the external world. Co-management implies taking on a similar role, with the additional advantage of bringing in more stakeholders with new skills and capacities to strengthen their performance more equitably and sustainably.

All this will mean a lot of grassroots level work: to improve the capacity of different stakeholders to contribute meaningfully to the process of setting up, implementing and monitoring a co-management mechanism; then actually setting up appropriate mechanisms with representation of the different stakeholders, while addressing the attendant challenges of consensus building and power sharing; and then implementing it. It is a big challenge for anyone, obviously, and one that the fishers cannot simply address on their own, but it is such challenges that necessitate development responses.

2. *Access to affordable technology*

Overcapitalisation and mounting cost of operations has been the most important constraint facing the fishers and their responses to cope with it have taken the following forms:

- Optimising operations
- Living for the day
- Slash-and-burn fishing
- Technological innovations
- Consolidation strategies
- Part-time operations

Of these, slash-and-burn fishing and living for the day are Red Box strategies. Part-time operations might be optimising strategy but not sustainable, hence can be ignored. Optimising operations, technological innovations and consolidation strategies can be improved by local interventions. Salagrama (2006b) provides a range of options for improving the strategies.

Access to technology is closely linked to access to investments and credit. Refining the existing credit programmes in line with the different LED related needs of the fishers is a local initiative to improve the asset base of the fishers significantly.

At the macro-policy level, an important initiative might be to shift focus from introduction of capital-intensive, potentially harmful technologies to simple, low-cost technologies (which might involve improved designs of traditional crafts or designing new crafts) whose capacities are such that they cannot lead to adverse environmental impacts. Any idea for developing new fishing boats must however be contingent upon these being replacement crafts rather than new additions to the fleet.

In a context where existing systems cannot really have a controlling influence on the proliferation of boats, the options are for improving such controls – which can only happen through stakeholder participation – or to stop promoting the technologies altogether. In the first case, obviously a lot of work will be required from a development perspective.

3. *Access to sustainable markets*

The major adaptations that fishers have made to cope with the changing market context related to:

- Diversification of supply sources and markets
- Protecting market turfs
- Living for the day
- Consolidation of production, processing, and trade activities

Apart from living-for-the-day strategies, all the others are viable. But there is still scope at the local level to enhance the women's access to markets, reduce competition and address their immediate needs for ice, transport and finance (rather than waste precious resources on exotic concepts which involve new products, new markets, new organisational arrangements and new risks) in a more meaningful manner.

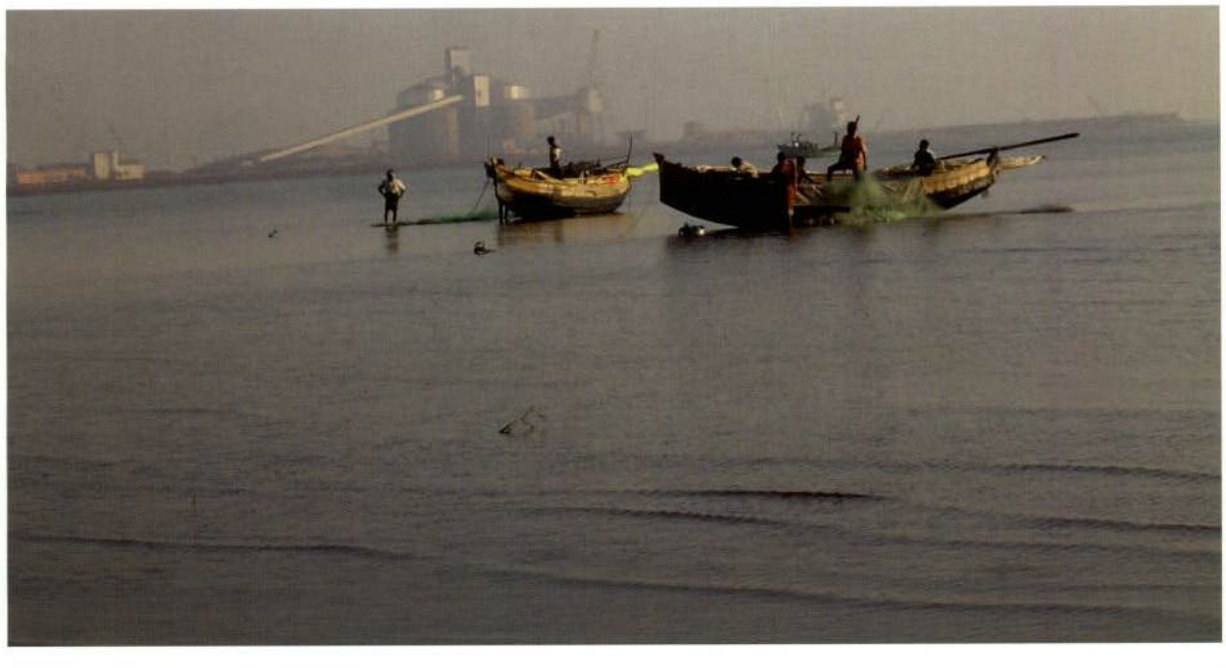
Livelihood diversification strategies

Apart from direct enhancement related strategies, which are not always sufficient to address the problems adequately, the fishers undertook a range of livelihood diversification strategies, which were summarised under 4 broad categories while recognising that livelihood diversification would proceed along more axes (for e.g., involving shifts from individual to household based livelihood profiles).

Strengthening existing diversification strategies of the local variety – i.e., involving shifts within and outside fishing – would require local responses to enhance the capacity of the fishers and their access to the new opportunities. Where the shifts involve geographical movements as well, there is a need for more concrete macro-level responses.

Firstly, there is a need to accept migration as a way of life for many people and take measures to legitimise the process so that people who migrate can have access to social security and other basic human rights. Capacity- building at the local level is one strand of the strategy to deal with this, while the other deals with setting up proper institutional mechanisms to help people to cope with their 'migrant condition' more confidently.

Secondly, there is a need to focus on conditions of the migrants' families in the absence of their main earners for long periods of time, which will require local initiatives for direct support as well as macro-level initiatives to ensure access to basic needs for these people.

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Annexure A: Checklist for Field Interactions

A. Community level

1. Overview of fisheries, fishing, fish processing, trade and ancillary activities in the area, including traditional livelihood diversification patterns

> Analysis of the fisheries sector – and the stakeholder groups within it – might become easier if we focus upon different market supply chains – local fresh trade, processed fish trade, distant/ urban fresh trade, export fish trade and ancillary fish trade (which include poultry feed, aquaculture feed etc.).
>
> For each category, we can then focus upon the activities involved from production through processing/handling and trade. This brings into discussion questions about the different stages in each supply chain, the intermediaries involved at each step, the technology used for preservation/processing/value-addition as well as for communications and transport, markets catered to, credit arrangements between successive groups, mode of payment between successive stakeholders etc.

2. Different stakeholders involved in different fish supply chains and their COGASE characteristics
3. Major changes observed in fish supply, transformation and demand areas in the last (?) years – not more than 10 major changes, including their causes and consequences upon livelihoods
    a. Fish resources
    b. Boats
    c. Engines
    d. Nets/fishing methods
    e. Target species
    f. Preservation and processing (ice, freezing)
    g. Market supply chains
    h. Margins of trade
    i. Transport facilities
    j. Trade intermediaries
    k. Credit sources and varieties
    l. Sharing patterns
    m. Traditional migratory/diversification patterns
    n. Etc.
4. Livelihood enhancement strategies
    a. Adaptive strategies – related to all the above
    b. Coping strategies:
        i. Within the existing activity – going back to basics, cost reduction strategies, market diversification, new credit arrangements etc
        ii. Outside the existing activity
            1. Within fisheries
            2. Outside fisheries
5. Enhancement strategies adopted at the poorer/marginalised stakeholders' level
6. Livelihood support programmes implemented by different agencies (government & CSOs) in the village and their overall effectiveness

7. Opportunities that exist or have been identified by the fishers but not being taken advantage of for lack of some necessary assets/conditions

8. Identify major livelihood enhancement streams for further exploration at the household level

Selection of major livelihood streams:

For selection of major livelihood streams, select only those activities that have led to changes in the orientation of the activity itself rather than those that are minor adaptations like changes in the mesh size or fishing depth (unless they lead to targeting a new species of fish that opens up a new market chain and brings in a whole new set of intermediaries and entirely new rules of the game). These could be changes in terms of: fishing boats, engines, fishing operations, species, markets, intermediaries, credit arrangements etc., which have led to significant changes in the way fishers operated and lived. Make sure to reflect the changes/strategies at the producers' level, at the processors'/intermediaries' level and at the traders' level.

The actual number may be determined according to the choice available and also based upon time taken for interviews at the household level. To the extent possible, there must be representation from all five streams discussed, i.e., adaptive strategies; coping strategies within existing activity; coping strategies within fisheries; coping strategies outside of fisheries and coping strategies adopted by the poor & marginal groups. There might be so few options in a village that we may end up with only 4 or 5 households to interview and in other villages the choices may be unlimited. We can be flexible in our selection and the time we spend in each village – for instance, a village with fewer choices may be completed in one day while another with more choices may take 3 days. Overall, however, the average time spent per village cannot exceed 2 days.

9. Select representative households involved in the selected livelihood enhancement streams for more intensive discussions.

B. Household level

1. Characterise the livelihood context of the household:
   a. Patterns of diversification within the household
   b. Seasonality of different activities
   c. Income-expenditure patterns to determine the main livelihood activity contributing to meeting subsistence needs
   d. Timeline to determine how traditional/recent the diversification process is in each case.
2. Regarding the particular livelihood stream to be discussed at the household level:
   a. Factors contributing to the choice of a livelihood enhancement strategy
      i. Different assets – availability/access
      ii. Policy-related – credit, subsidy, welfare/development policies
      iii. Institutional mechanisms
      iv. Seasonality and shocks
      v. Markets and competition – the opportunities posed by new market openings

Fish are available in deeper waters – boats are available on credit/subsidy – government support for engines and nets forthcoming – availability of technical skills? – social support – knowledge about fishing grounds? – new markets and supply chains coming into existence – new intermediaries – new financing mechanisms – so on.

b. SWOT of the particular livelihood activity

   i. Changes in access to different assets (which contributed to the choice of a particular livelihood activity in the first place)

   ii. Policy-related – credit, subsidy, welfare/development policies (as above)

   iii. Institutional mechanisms

   iv. Seasonality

   v. Shocks – how capable are the new activities to cope with a disaster like tsunami?

   vi. Markets and competition – the threats posed by new market openings

c. What can be done to improve the sustainability of the livelihood activity?

d. What changes affect traditional LED patterns and how can these be addressed?

e. How effective are the post-tsunami LED programmes and how can these be improved?

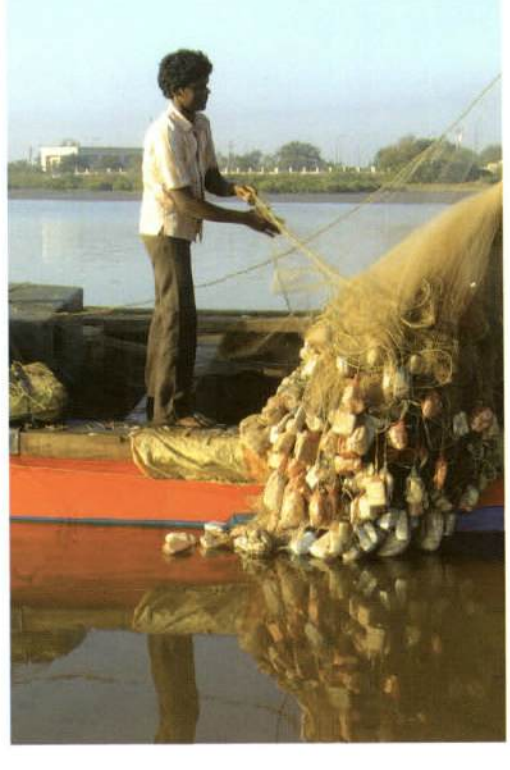
f. What other opportunities exist in the neighbourhood but are not being made use of and why?

g. What can be done to make these more accessible?

C. Revision, validation and gap filling

1. After household level discussions, the teams will compare notes at the end of the day to identify gaps, come up with new areas to explore when we visit the village again the next day for interactions with a few more households drawn from the same streams as before for repeating the exercise. This helps clarify doubts, adds more flesh to the information and validates the information obtained in the interactions with the first bunch.

2. After the h/h interactions, the teams will attempt to meet with the local village elders, NGO staff, other informants such as teachers, bank staff, moneylenders, and traders to obtain their perspectives on the issues.



Annexure B: Field Study Sites

The following table provides a list of the more important field areas covered by the study team. There are more villages – such as Pozhayur in Kanyakumari – which were covered to explore certain livelihood streams exclusively, but these are not included in this list.

State	District	Villages
Tamil Nadu	Villupuram	Anichankuppam
		Kaipenikuppam
		Sinna Mudaliar Savidi
	Chingleput	Pudhukalpakkam
	Cuddalore	Parangipettai (Annankovil)
		Pillumedu
		MGR Thittu
	Nagapattinam	Pazhayar
		Nagapattinam
		Akkaraipettai
		Tarangambadi
		Arcotthurai
	Kanyakumari	Thoothoor
		Chinnathurai
Kerala	Ernakulam	Kochi
		Munambam
	Thiruvananthapuram	Kovalam
		Vizhinjam
		Adimalathura
		Marianad
	Kollam	Alappad
	Alapuzha	Aratupuzha
Andhra Pradesh	East Godavari	Kakinada
		Uppada
		BCV Palem
	Visakhapatnam	Venkatanagaram
		Revu Polavaram
	Srikakulam	Mofus Bandar
		Budagotlapalem

Annexure C: Livelihood Groups in Fisheries Sector

Sl No	Category	Livelihood group
1.	Producers	1. Mechanised boat owners
		2. Mechanised boat crew
		3. Motorised boat owners
		4. Motorised boat crew
		5. Non-motorised boat owners
		6. Non-motorised crew
		7. Shore seine owners
		8. Shore seine crew
		9. Shell collectors
2.	Processors	10. Dry fish processors
		11. Poultry feed manufacturers
		12. Dry fish processing assistants
		13. Poultry feed manufacturers assistants
		14. Processing plant owners
		15. Processing plant workers –women
		16. Processing plant workers – men
		17. Peeling workers working in pre-processing plants
		18. Household peeling workers
3.	Traders	19. Petty fresh fish traders – women
		20. Petty dry fish traders – women
		21. Large-scale fresh fish traders – women
		22. Large-scale fresh fish traders – men
		23. Cycle traders/Moped traders
		24. Commission agents
		25. Independent traders dealing with commercial species
		26. Company agents
		27. Resellers –men
		28. Resellers – women
		29. Traders for shrimp brooders
		30. Shrimp head buyers
		31. Dry fish traders assistants
		32. Small –scale shell buyers
		33. Large –scale shell buyers
4.	Ancillary workers –skilled	34. Auctioneers – men
		35. Auctioneers – women
		36. Fish graders
		37. Shrimp peelers
		38. Net menders
		39. Electricians
		40. Engine mechanics
		41. Battery repairers
		42. Wooden boat makers – carpenters
		43. Steel boat builders
		44. FRP boatyard owners
		45. FRP boatyard crew
		46. Kattumaram makers
		47. Welders and tinkers
		48. Boat painters

Sl No	Category	Livelihood group
		49. Brooder technicians
		50. Company Accountants
5.	Ancillary workers – supply of inputs	51. Ice plant owners
		52. Ice plant workers
		53. Ice sellers
		54. Nets and other fishing equipment sellers
		55. Fuel sellers
		56. Ice box sellers
		57. Basket weavers and sellers
		58. Salt sellers
6.	Ancillary workers – services	59. Ice crushers
		60. Rickshaw pullers
		61. Fish carriers by head load –women
		62. Fish carriers by bicycles
		63. Fish packers
		64. Fish weighment supervisors
		65. Fish loading boys
		66. Fish carrying helpers – boys
		67. Auctioneer assistants
		68. Water suppliers – men
		69. Water suppliers – women
		70. Insulated vehicle drivers and assistants
		71. Mobile van drivers
		72. Auto transporters
		73. Fish cutters
		74. Village criers
		75. Barbers
		76. Church Commission collectors
		77. Literate youth involved in intermediate activities of production and supply
7.	Ancillary workers – non fisheries	78. Grocery shops
		79. Petty food vendors
		80. Money lenders
		81. Old cloth resellers
		82. Coconut sellers
		83. Restaurant owners
		84. Restaurant staff
		85. Eatables sellers

Annexure D: DRAFT Livelihood Enhancement and Diversification (LED) Assessment Framework

Introducing the LED Assessment Framework

In Chapters 3 & 4 of the study, we have developed typologies of different livelihood enhancement and diversification strategies amongst the fishing communities. In Chapter 5, we have summarised the key factors contributing to the choices of the fishers and assessed the choices for their sustainability-equity implications. Based upon this analysis, it is our intention to develop a provisional framework for assessing the opportunities for livelihood enhancement and diversification in the coastal fishing communities in the tsunami-affected regions of Southern India and beyond.

The framework is designed to be a simple tool for use in decision-making, while ensuring that the complex processes that characterise choices in livelihood enhancement and diversification are adequately captured. The framework is also intended not only to provide an opportunity to assess the sustainability of an existing or proposed strategy, but also to help with project management and monitoring as well as to provide ideas for new strategies by building upon local opportunities.

The format is designed in such a way that each component will need to be carefully assessed and weighed for its sustainability implications. However, it is intended to be used with intuition, imagination and commonsense – as a set of guidelines to help in decision-making rather than as a mechanical exercise for filling up the boxes.

Obviously, a major concern with a framework of this nature is that it can get too complicated or too simplistic. A correct balance can only be attained through an iterative process over long periods of time. However, it is hoped that this will act as a template for future work on assessing livelihood enhancement and diversification opportunities within and beyond fisheries.

A simple four-step process has been developed to assess the viability of a livelihood enhancement and diversification idea and to derive some guidance about what interventions at what level would be required to make it work.

Step I: Developing a LED checklist

In the first stage, the key components of different elements influencing livelihood choices of the fishers are arranged in the Sustainable Livelihoods format. As we have seen, the main elements that go into the choice of a livelihood are:

- The strengths of the fisheries sector[74]
- Its vulnerability context
- The asset base of the fishers
- The policy-institutional context characterising livelihood choices
- The livelihood choices of the fishers, and
- The factors contributing to the livelihood choices

Using the above, a detailed checklist is developed consisting of the components of a livelihood strategy in the first column, the criteria relevant in the choice of livelihood strategies in the second column and the indicators/options for each criterion in the third column.

[74] *Which is also relevant in assessing alternatives in a different sector*

Livelihood component	Criteria for choice of livelihood strategies	Indicators/options/conditions
1. Livelihood outcomes		
	• Economic growth • Income	• Real income generated • Equity implications: distribution of benefits • Assurance of income: annual and long-term • Level of income: higher than/equivalent to existing activities • Level of income: ability to meet subsistence needs
	• Quality of life considerations	• Working conditions • General quality of life
	• Freedom and independence	• Decision-making choice at work • Freedom of being in own environment • Freedom to change course
	• Overcoming social and economic oppression	• Oppression on gender/caste/social lines • Indebtedness and economic hardships
	• Social and economic mobility	• Status of new activities in relation to existing ones from a social/economic perspective
		• Opportunities for upward mobility in social and economic terms
2. Livelihood Strategies		
	• Sustainability of employment opportunities	• Over time • With increased competition
	• Availability and access to resources, technology, investment and markets	• Over time • With increased competition • Non-competitive strategies/assured niches for poor
	• Opportunities for diversification	• Of supply sources • Of supply systems • Of markets • Of consumer base • Of livelihood options
	• Nature of employment*	• Wage-earning • Share from returns • Combination of both
	• Source of employment*	• Primary sector • Secondary sector • Services • Government service
	• Domestic economic base*	• Individual/single-activity oriented • Household/multiple-activity oriented
	• Options for optimising costs within existing activities	• Going back to basics • Changes in operations to reduce costs • Changes in sharing patterns • Sharing risk • Consolidation of activities
	• Extent of diversification away from primary activities	• Seasonal regular • Part-time irregular • Full time

Livelihood component	Criteria for choice of livelihood strategies	Indicators/options/conditions
3. Assets		
A. Natural assets	• Sustainability of access	• Overall health of natural resources • Over time • With increased users/usage • With increased production efficiency
	• Origin/availability of raw material	• Physical access (local/non-local) • Entitlement-related (affordability)
	• Terms of access to resources	• Open access • Common property arrangements • Restricted or banned access • Purchase in open markets
	• Affordability to the poor users	• Over time • With increased users/usage
	• Seasonality	• Seasonal availability • Regular availability
	• Impacts upon other users	• Positive • None • Negative
	• Acceptability and adaptability[75]	• Markets • Caste/culture related objections • Conventions • Lack of skills • Adaptability of the resource to local ecological conditions
	• Alternatives available	• Sources of supply • Cheaper sources • Better quality
	• Shelf life	• Perishable without post-harvest care (fish) • Lasts some time without post-harvest care (vegetables) • Lasts long without post-harvest care (rice, textiles)
B. Physical Assets	• Availability	• Local availability • Availability at a distance
	• Adaptability	• Fit with local ecological context • Fit with local socio-economic context • Fit with institutional context – local and macro-level
	• Appropriateness	• Addresses a constraint • Addresses existing gaps • Enhances efficiency
	• Adequacy	• In meeting the requirements • Quality of construction
	• Affordability of the technology	• Direct access to technology • Meeting working capital needs • Changing terms of access to the natural resources as a result of technology
	• Resilience	• Coping with the ecological conditions • Coping with usage conditions
	• Infrastructure for different supply chains	• At the landing centres • At the markets • In between (transport and communication facilities)

[75] *Refer to the section on Natural Assets under the Factors contributing to LED choices in Chapter 5 for examples*

Livelihood component	Criteria for choice of livelihood strategies	Indicators/options/conditions
	• Existence of forward and backward linkages[76]	• For production • For processing • For trade
	• Alternatives available	• Indigenous technology • Cost effective alternatives • More appropriate/efficient options
	• Management of individual assets	• Regular management and operation • Support for maintenance and repairs • Support for replacement of spare parts or whole asset
	• Management system for group based assets	• Regular management and maintenance • Ownership and management in the post-support period
	• Impacts upon different components	• Natural resources[77] • Existing technologies and their users[78] • Traditional livelihoods within the activity[79] • Traditional livelihoods outside the activity[80] • Markets • Different market-related stakeholders • Indebtedness for capital investment • Indebtedness for working capital • Physical comfort factor • Social status
	• Potential for capacity/efficiency enhancement in harvesting systems[81]	• Exists • Doesn't exist
C. Human assets	• Origins of the new strategies	• Build upon local strengths • Imported from elsewhere
	• Prior experience and capacity to manage the asset (extent of control over it)	• Level of understanding about the technology • Capacity to undertake maintenance and repairs • Capacity to make necessary investments
	• Access to human assets necessary to support a strategy	• Universal • Availability of skills and capacity confined to a few • Difficult to provide, requires developing alternative support[82]
	• Impact upon human assets	• Economic security of the target group • Access to better quality of life
		• Ability to take advantage of new opportunities • Self-esteem/social status • Knowledge base • Safe and healthy working environment
	• Usage of labour	• Labour-intensive[83] • Uses alternatives to manual labour
	• Target of the new activity	• Younger generation

[76] *Markets, infrastructure, transport, electricity, communications facilities, support services; traders and credit linkages, post-harvest facilities, market access Precautionary principles to be applied*

[78] *In terms of competing for the same resources, damaging equipment, reducing access*

[79] *For e.g., introduction of machine-made nets (in fisheries), power looms (in weaving) and tractors (in agriculture) have reduced work opportunities for those traditionally involved in such activities*

[80] *The introduction of insulated/plastic containers for fish marginalises traditional basket weavers; arrival of ice reduces the demand for salt (for processing purposes).*

[81] *Precautionary principles to be applied*

[82] *For instance, the capacity of the fishers to deal with FRP or engine technology remains limited in spite of working with them for over 2 decades.*

[83] *For e.g., production activities for incense sticks or beedis are dependent on manual labour and their economies of scale do not allow mechanisation or entry of more powerful competitors into production*

Livelihood component	Criteria for choice of livelihood strategies	Indicators/options/conditions
		• Those already involved in other activities • Everyone in a village generally • Poor/vulnerable groups
D. Social Assets	• Focus of the strategy	• Individuals • Households • Groups
	• Acceptability	• Existing social networks • Social security mechanisms • Prevailing norms and value systems • Power and patronage relationships • Vertical and horizontal connectedness
	• Equity	• Affordability of access • Affordability of usage • Affordability of upkeep • Equity implications for other stakeholders
	• Gender roles • Impact on gender balance	• Preserving gender roles
	• Impacts upon the poorer stakeholders	• Direct stakeholders[84] • Indirect stakeholders·
	• Building upon existing social security mechanisms within livelihood context[85] ·	• Direct stakeholders in supply chains • Indirect stakeholders
E. Financial Assets	• Access to investment	• Capital costs • Working capital • Maintenance and repairs
	• Economic viability of investment especially in terms of the capacity of people	• Viable • Viable for working costs, but not capital costs[86] • Not viable
	• Incentives	• Advances • Subsidies • Credit support
	• Terms of trade for supplies	• Cash-down • Part payment • Deferred payment
	• Credit support tailored to suit the local livelihood context	• Individual/household oriented • Recovery cycles[87] • Seasonality
	• Access to credit	• Availability • Affordability • Consistency
	• Conditions for obtaining credit	• Collateral • Margin money • Minimum savings • Minimum participation • Group acceptance
	• Adequacy of credit support	• Fixed sums • Need-based • Variable depending on repayment record

[84] *Direct stakeholders are those directly employed in different stages of a supply chain and indirect stakeholders are those involved in other supply chains but influenced by changes in one supply chain.*

[85] *These include: allowing women to auction for fish, supporting resellers and local women traders with assured supplies of fish, allowing poorer people access to fish for consumption, giving custom to petty sweetmeat sellers to ensure their survival, allowing a share to anyone who pulls a shore-seine…*

[86] *Which is the case for post-tsunami support initiatives like FRP boats: the fishers can perhaps meet the operational costs, but the capital costs are beyond them; this becomes a sustainability issue when the time comes for replacing the asset in due course.*

[87] *Recovery cycles can be daily or weekly (as in many private lending operations), or monthly; different people have different turnover cycles – small traders have daily turnover, wage earners have monthly turnovers, larger establishments might have annual turnovers and their capacity to meet their financial obligations follows the same pattern.*

Livelihood component	Criteria for choice of livelihood strategies	Indicators/options/conditions
• Form of credit	• In cash	• In kind – linked to physical asset creation[88] • In kind – linked to enterprise development
	• Form of recovery	• In cash • In kind – with fish
	• Timeliness of credit	• On the spot • Time consuming • At fixed intervals
	• Controls on use of credit	• Production • Consumption • Social expenditure • None
	• Impact upon the relations with other credit sources	• private financiers • Banks • Government-sponsored credit programmes (Cooperatives) • SHG/NGO credit
	• Risk sharing in case of a loss	• Part waiver of loans/interest • Full waiver of loans/interest • Fresh investment • Insistence upon repayment of past loans
	• Procedures for recovery from defaulters	• Peer pressure • Social disgrace • Fines and penalties • Rescheduling
	• Assurance of access to credit for regular use	• Exists • Depends upon conditionalities[89] • Depends upon certain conditions[90] • Does not exist
	• Alternatives for credit	• Enhancing access to, or developing, other assets • Shifting people to wage-employment • Strengthening social capital
4. Policies, Institutions, Processes (PIP)		
A. Policies	• Fit with the existing policy context	• Sectoral policies • Macro-economic policies • Global policies (esp. related to trade and environment)[91] • Emerging policy concerns in all the above
	• Capacity building	• At the community level to cope with existing/new policy concerns[92] • At the institutional level to develop appropriate policy responses
	• Clarity and coherence	• Between policies and local needs • Between policies and their implementation • Between policies from different sectors/ ministries • Within policies to smoothen contradictions

[88] *Providing credit in the form of boats would mean that fishers must take them whether they need them or not; such credit can become a major problem when the time comes for repayment. Credit linked to enterprise development boils down to making people shareholders in a business over which they have little or no control – but they will still need to bear the risks in case of failure.*

[89] *Many banks used to blacklist whole villages for non-repayment of loans by a few people; several SHGs insist upon every member of the group making a full repayment before everyone can get a fresh loan.*

[90] *Such as: the SHG mechanism continues to survive after the withdrawal of the project*

[91] *These include concerns about supporting subsidies for enhancing capacity or efficiency of harvesting technologies, from ecological and trade perspectives.*

[92] *This includes such themes as setting up Special Economic Zones, the Sethusamudram Project in the Gulf of Mannar/Palk Bay area, establishment of Marine Protected Areas*

Livelihood component	Criteria for choice of livelihood strategies	Indicators/options/conditions
	• Policymaking context	• Participatory approaches • Conventional approaches
	• Policymaking to reflect local needs	• Support for more representative and responsible management of marine wealth • Support for equitable distribution of benefits from the wealth of the sea • Support for weak and marginalised groups • Support systems to deal with LED strategies and the 'migrant condition'
	• Subsidies	• Direct subsidies • Indirect subsidies
	• Regulatory mechanisms	• Self-regulating • Regulation by government • Regulated by markets • No regulation
B. Institutions[93]	• Fit with the local livelihood context	• Supporting existing livelihoods • Promoting sustainable practices • Enhancing people's capacity to cope with issues
	• Fit with local systems	• Formal governance systems • Informal governance systems • Markets
	• Fit with the local social context[94]	• Social norms • Caste codes • Taboos/beliefs • Cultural mores
	• Representation of the poorer stakeholders	• In the formal systems • In the informal systems • In the newly created systems (SHGs)
	• Coping with local demands	• Factionalism • Patronage relations
	• Information flows	• Between the decision-making bodies (government, NGOs) and the fishers in both directions • Within communities to reach the poorer and the marginalised groups
Markets	• Access to markets	• Ready access • Steady access
	• Level of competition	• For supplies, markets and meeting infrastructure needs
	• Competence (i.e., ability to compete) especially for the poor	• As more people enter the activity • As more powerful people enter the activity
		• In comparison with other similar products in the market
	• Economies of scale	• Strength of the demand[95] • Diffuse demand[96]

[93] *Institutions relates to structures – like organisations and markets – as well as the 'rules of the game', such as culture, caste, religion, customs, taboos, worldviews…*

[94] *It is not necessary that there must be a fit with the local social and cultural context in every respect: in fact, there is perhaps justification for going against some of these in order to achieve more sustainable and equitable results. However, attempts to transcend the 'existing reality' are difficult (not least because the people who might benefit from a change share the same worldview that we propose to change) and require time, strategy, effort, patience, and tact to yield sustainable benefits. On the other hand, inability to take them to a final conclusion can only mean further deprivation and hardship for those we intend to help.*

[95] *Economies of scale become dicey when every SHG in every village enters into fish pickle making or tailoring; we have seen how limited demand for their product gave rise to specialisation among traditional basket-weaving communities to avoid glutting the markets.*

[96] *Demand in any one location (except in urban areas) too small to achieve economies of scale; this is important in case of large-scale investments for ice plants, processing infrastructure or transport systems. It also applies to demand for 'niche' products like dried fish in urban areas, which tends to be diffuse.*

Livelihood component	Criteria for choice of livelihood strategies	Indicators/options/conditions
		• Building in the transaction costs[97]
	• Consistency of supply	• Seasonality of supply and demand[98] • Fit between production and demand[99] • Linkages with different supply sources
	• Flexibility	• In coping with seasonal variations • In addressing consumer preferences • In changing market orientation to cope with changes in supply or demand • In organising production and marketing systems and relations
	• Length of the supply chain	• Capacity of the system to bypass intermediaries sustainably • Local/domestic alternatives to enhance producers' control
	• Bypassing intermediaries in a supply chain	• Opportunity to generate substantially higher income for the producers • Capacity of the system to take on the risks borne by the intermediaries in supply chains while ensuring higher returns • Capacity of the system to take on non-trade related services provided by intermediaries
	• Implications of changing demand for different stakeholders	• Within the same supply chain • Between different supply chains • People not directly a part of a supply chain but depending upon its existence[100]
C. Processes[101]	• Level of participation of the target groups (level of ownership)	• Exclusive[102] • Contractual • Consultative • Collaborative • Collegial
	• Extent of participation by the target group	• At specific points in the project life • Throughout the project • Whenever there is a need • Non-existent
	• Design of the project	• Based upon existing skills • Based upon existing needs • Based upon a combination of both • Based upon funding agency requirements • Based upon local contingencies
	• Building upon strengths	• Participation of the people • Drawing upon past learning • Drawing upon the skills and competence

[97] *This involves comparing sale prices between the local area and a distant urban area, ignoring the transactions costs, margins at every level and market risks; in several cases, this also involves ignoring the direct/indirect subsidies from the intervening agencies.*

[98] *Because fish are seasonally available, the demand for services like ice and transport systems also tends to be seasonal.*

[99] *For instance, developing demand for a particular fish product based upon a seasonally available fish or exploring options for large-scale trade when the production systems can hardly cope with the demand*

[100] *These include the various categories of ancillary workers involved in various input and output related activities on the shore, during transport and in the markets.*

[101] *Processes relate to 'real' factors that have relevance in actual implementation of a project, often transcending the written and unwritten rules of the game. The project management may be clear about what it aims to do and the broad approaches it must use to fulfil its objectives, but the actual process of implementation is a different kettle of fish, influenced by a range of 'processes' over which one may have little or no control. One example would be the need to work with the more powerful people in every village in order to gain entry into the village and survive there, knowing that this implies making concessions to the same people (and even reinforcing their status) whom the project might be trying to 'dis-empower'; another example would be the membership in many SHGs being held by the well-off people from the influential sections of a community, who also have a major say in the organisation and functioning of the SHG. The need to find an entry point may be a consideration for doing this in the beginning, but later this becomes necessary because the more powerful are also the more knowledgeable and articulate (while the poorer people lack both) and can explain the justification for the project in the area in a way that makes them indispensable.*

[102] *Refer to Campbell & Salagrama (2001) for definitions of the types of participation*

Livelihood component	Criteria for choice of livelihood strategies	Indicators/options/conditions
		• Leveraging on other resources/support systems in the area
	• Responsiveness	• Scope for flexibility in the project design • Feedback generation • Impact and process monitoring • Access for poor to decision-makers
	• Time-frames in implementing a project	• Pre-fixed • Open-ended • Based upon assessing the time to become self-sustaining
	• Funding pattern	• Pre-fixed • Open-ended • Based upon assessing the funds required to become self-sustaining
5. Vulnerability context (VC)		
	• Understanding about VC in designing LED initiatives	• Impact of Trends • Impact of Seasonality • Impact of Shocks
	• Capacity of the target group to withstand the impacts of VC	• Coping with Trends • Coping with Seasonality • Coping with Shocks
	• Building upon existing strategies to cope with VC	• LED strategies dealing with trends • LED strategies dealing with seasonality • LED strategies dealing with shocks
	• Extent to which impacts of VC can be overcome by new strategies	• Overcoming the impacts of trends • Overcoming the impacts of seasonality • Overcoming the impacts of shocks
	• Capacity of social security nets to cope with VC	• Social support to cope with trends • Social support to cope with seasonality • Social support to cope with shocks

The different aspects covered in the checklist are expected to help people to explore a range of issues before they can settle for an appropriate option. At the same time, the elaborate detail presented in the checklist is intended only to highlight the different issues that can have implications on a livelihood choice; as it stands, it has a broad scope and is more detailed than is perhaps necessary for a specific livelihood support activity. In practical terms, it is much less elaborate and is expected to take no longer than any project planning process. To be practical, each of the components ((as well as the criteria and their indicators) will need to be disaggregated to a more concrete level – for instance, natural assets can be split further into fish, sea, mangroves, beach, casuarina plantation and estuaries – so that specific issues relevant for each sub-component can be reflected in the analysis.

Some of the criteria, such as those marked with an asterisk (*), provide a range of options, where each option has its own merits and demerits that cannot be externally assessed; the choice of an appropriate option among these can vary from one stakeholder group to another and from one place to another. This will mean that the checklist can work effectively only when used in consultation with the fishers.

Step II: Assessing the viability of options

Once a reasonably detailed checklist is developed, three questions will need to be asked of each indicator/condition/criteria in order to assess their sustainability-equity implications:

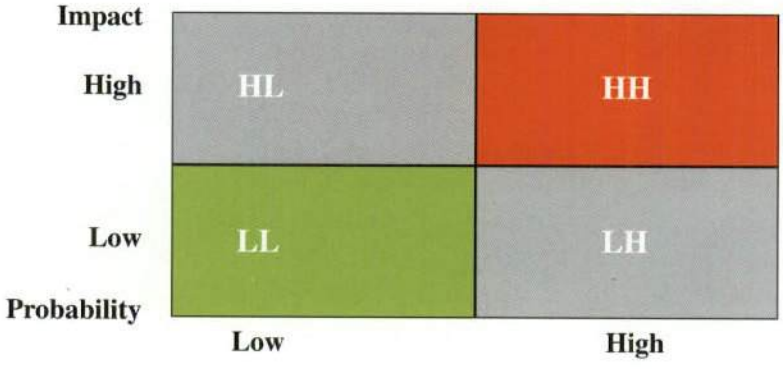
- Is the condition *available*?
- Is it *accessible* to the target group?
- Is it *appropriate* to the existing livelihood context[103] ?

[103] *i.e., livelihood context as we defined it in the study, as consisting of the strengths and weaknesses of the sector, the asset base of the fishers and the policy-institutional context*

The access to different indicators/conditions required for meeting the criteria for livelihood choices would vary: in some cases they are straightaway positive (or available), in some they might require some effort, and in some others, they may not be positive (or available). Those indicators/conditions falling into first category do not pose any further problem and we can proceed to the next indicator. It is for those which require some effort or those that may not be accessible at all that further analysis would be necessary in order to ascertain how important they are for achieving the project objectives, which takes us to the Step III.

Step III: Sustainability impact assessment

Where terms of availability/access/appropriateness to a required condition do not look favourable, the condition will need to be assessed against an impact-probability matrix: i.e. (i) the likely impact upon a strategy if the condition were not to be met and (ii) the probability of not being able to meet it. Obviously, quantifying impacts and probabilities is not always possible, so some sort of precautionary principles (or Murphy's Law: anything that can go wrong, will!) will need to be applied here.



- **LL**: if an indicator/condition cannot be met, its impact on the project is low and the probability of its not being accessible is also low. This means that the project can go ahead even if the criteria for the choice are not positive for that particular sub-component.
- **LH**: low impact and high probability – the impact of not being able to meet a condition is low, but the probability of not being able to meet the condition is high. The project can still go ahead since the lack/absence of a condition is unlikely to affect the project objectives or outcomes, but it will bear watching to see that the high probability levels do not lead towards higher impacts.

- **HL**: high impact and low probability; the impact of not being able to meet a condition is high, but the probability of not being able to meet the condition is low. The project must build in suitable **mitigation measures** (in terms of improving the asset base of the fishers or tackling the macro-policy environment to create the necessary conditions for improving access to the condition/ criterion) in order to proceed.
- **HH**: high impact and high probability – the impact of not being able to meet a condition is high and the probability of such a thing happening is also high; this is called the 'killer assumption', which means that the chances of failure are high, and it is necessary to seek out more sustainable alternatives to the option/condition or redesign the project itself.

An option that involves major assumptions which fall into the first category (LL) is clearly acceptable and we can proceed straightaway to the next indicator/option, while those falling into HH are clearly unsustainable, and require revisiting the project purpose. It is the indicators/conditions falling into LH and HL category that will need to be further explored (Step IV) in order to assess whether they can be made more sustainable.

The impact-probability matrix is not a static format for all places, all people and at all times. Even within a given context, a small NGO with limited funds (or a big NGO with limited timeframes) may find several issues falling into the HH Category, but a bigger NGO might find fewer HH activities, an INGO still fewer numbers, and a government entity (or an organisation like the World Bank) very few HH activities by virtue of their superior capacity. If it is possible to generate one giant logframe for covering all aspects of livelihood support for a given location, it would be possible for even small scale interventions (which might not necessarily have the capacity to undertake macro-level initiatives) to feed into a 'common pool', so that the different activities will add up to a meaningful livelihood support programme for the fishers.

Step IV: Assessing mitigation measures for indicators in LH and HL categories

Now that the indicators that have no relevance are discarded, it is necessary to tackle those with high levels of impact or, to a lesser extent, high level of probability, to assess the mitigation measures that will be necessary to push the H (high) factors in the impact and probability matrix towards L (low) – i.e., make the LH and HL activities to move towards a LL condition so as to bring their sustainability levels to acceptable limits or at least remain stable.

To identify suitable mitigation measures will require going back to the livelihood context. As we defined it, the livelihood context has four major elements: the strengths of the sector (the 'opportunity context'), the weaknesses (the 'vulnerability' context), the asset base of the fishers, and the policy-institutional processes (PIPs) that influence the strengths of the relations between the other three. While the opportunity context and the vulnerability context are taken as given (i.e., beyond our control), the assets and the PIPs can be influenced to make suitable adaptations in the relationships between the livelihoods and the larger processes governing them.

Thus, to keep things simple (if not simplistic[104]), one might say the measures that people take to address their livelihood concerns relate to (i) improving their asset base which give rise to direct changes in their immediate context, and (ii) informing and influencing policy, institutional processes, which give rise to less direct but more long-lasting changes for enabling the fishers to cope with their livelihood context more meaningfully.

Using this, the mitigation measures can be:

- Those making direct livelihood-level interventions aimed at developing the **asset base** of the fishers to help them deal more confidently with their livelihood context; and
- Those making policy and institutional level interventions for enabling a better livelihood context for the fishers.

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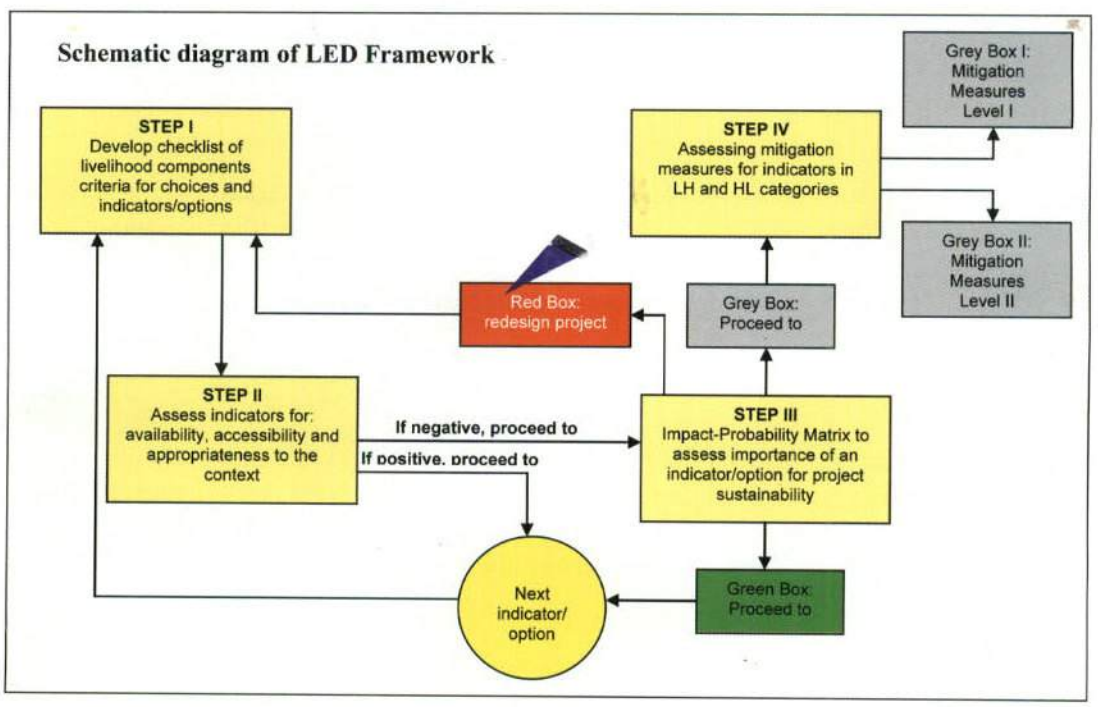
[104] *Because assets and PIPs constantly draw upon one another and operate simultaneously at the local and macro-levels*

The following table presents a flow-diagram of the LED framework:

STEP I	**Develop LED checklist listing livelihood components, criteria for each component, and indicators/options for each criterion**		
STEP II	**Assess each indicator/option for its availability, accessibility and appropriateness**		
	If positive, proceed to the next indicator/option	If negative, move to STEP III	
STEP III	**Impact-Probability Matrix to assess importance of an indicator/option for project sustainability**		
	Green Box: Proceed to next indicator	Grey Box: Move to STEP IV	Red Box: Killer assumption: redesign project
STEP IV	**Assessing mitigation measures for indicators**		
	Grey Box I: Mitigation Measures I level (direct, local, development initiatives targeting asset base)	Grey box II: Mitigation Measures II level (less direct, policy-level initiatives targeting policy-institutional context)	



For an activity to be sustainable, it must have a strong micro-macro linkage to cover both kinds of mitigation measures, and this would need to give consideration to the fact that the two would have different requirements in terms of:

- Scope of the project (direct, grassroots level initiatives or less direct macro-level initiatives; projects can also be doing both),
- timeframes (short, time-bound, projects/long, open-ended, programmes),
- resources (expertise in specific areas/broader development aspects) and
- financial resources

Once such requirements are properly calculated and assessed against the capacity of the system (or the intervening agency) to deliver the desired outcomes, it becomes possible to suggest whether a HL or LH condition can be shifted into an LL condition and made sustainable. This assessment becomes all the more important where non-conventional activities are being proposed or where the initiatives seek to overriding the existing social and economic systems like local caste or power equations.

LED Framework: Where do we go from here?

As indicated, the framework is the outcome of an analysis of several case studies discussed in the body of the report, and cannot be pieced out as an independent entity for practical application. In order to be practically useful, it will need to be field-tested more rigorously and tested against a number of actual live cases. The checklist presented above attempts to provide a broad range of ideas that have relevance in assessing a livelihood choice, but there is a need to reduce them to a more manageable number by prioritising the different criteria according to their importance and by focusing upon the more important ones.

Once this has been done, the next phase will involve developing the framework into a practical and handy reference tool, which requires reconstructing the framework in a more usable format, providing guidance as to how to assess each indicator, and illustrating each indicator with live examples and fleshing out the subsequent stages with more detail and additional examples.